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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Signs of Reviving Trade

THE President of the Board of Trade, speaking in Liverpool the other day, was able to confirm the hopes of reviving trade which are now general throughout British industry. The indications of improvement which have come to the knowledge of the Board of Trade far exceed the indications to the contrary. The Board are advised that in the United States, according to the best commercial opinion, the corner has been turned. From India it is reported that the bottom has been reached, and that recovery promises to begin. There are signs of a trade revival in Japan, one of the first countries to feel the slump, and one in which speculation in chemicals at one time reached a perilous stage. Official advices from British trade commissioners in the Dominions and in South America are all to the effect that the feeling is more hopeful. All this is distinctly encouraging. Commercial opinion is an extremely sensitive barometer of actual conditions, and a general conviction that trade is going to be good or going to be bad is an immense influence towards the development or the arrest of business. The atmosphere in which trade lives is credit and confidence, and the favourable advices to which Mr. Baldwin referred are strengthened by increased stability in political and economic conditions. The serious efforts to settle the Irish problem at home, the negotiations among the Powers represented at Washington to limit and discourage preparations for war and to work steadily for peace, the more reasonable attitude of labour on the problem of wages and production, and the steady process of discrediting mischievous communistic propaganda—all tend towards national and international security. It is, therefore, not unreasonable to hope that with the turn of the year will come a yet more decisive turn for the better in our home and export trade.

Last week we quoted Lord Leverhulme's advice to all engaged in British industry to talk good trade if they want good trade. With this may be associated that of Mr. Max Muspratt, who frankly told the representatives of British chemical industry assembled at the Connaught Rooms two weeks' ago that they had not learnt the duty of advertising. It was the exigencies of war and national necessity which revealed to the nation what a force it possessed in the science and industry of chemistry. What is true of the industry as a whole is true of its members. Corporately and individually they have to make their merits known; certainly their rivals will not do it for them. That means utilising the science of commercial publicity, as the financier and commercial organiser utilises the scientist himself. We may claim to have done some little to promote the fuller application of Mr. Muspratt's advice to chemical industry, and those who have acted upon it have no reason to regret their decision. The special issues of THE CHEMICAL AGE published from time to time have been the means of making various branches of British products known in markets which were formerly strangers to them; and we hope, in our Annual Review Number, to be published on December 31, to be able to tell our readers throughout the world something of what this country has done for chemical science and chemical industry during the current year.

The Sulphate of Ammonia Situation

DURING the past year the sulphate of ammonia producers in this country have, from the standpoint of market values, had to contend with exasperating conditions, for they have witnessed a fall in price of the material amounting to more than 40 per cent. In 1920 the average price realised in the home markets was no less than £23 5s. per ton, whereas in the summer of this year it had fallen to about £13, which is practically the same as the price it was fetching in 1914. It may be said at once, however, that the present condition of the industry cannot be accurately gauged by a consideration of market values alone, for it is far better to have an extensive market showing a comparatively lean profit than to have no market at

all. It is, in fact, with the object of widening their markets and extending the popularity of their particular fertilizer that the British Sulphate of Ammonia Federation have been working.

When one remembers how, some seven or eight years ago, the greater proportion of the home-produced salt was exported to such countries as Spain and Japan, and contrasts this situation with the present position, there is every reason to be gratified with the results which the Federation's campaign has yielded. The considerable extension of business has been effected in spite of the serious competition which must have been encountered with nitrate of soda dealers liquidating the huge stocks which they held over here, and one can only conjecture that the British farmer is beginning to get a thorough appreciation of the relative value of combined nitrogen units in their various forms. No doubt, the Federation's propaganda has been largely responsible for this, and the principal fact which stands out is that the British consumer is utilising no less than four times as much sulphate of ammonia as he did before the war.

The German market has, as was to be anticipated, been lost; but although that country appears to be in a good position for looking after all its own requirements, it has, so far, offered none of its synthetic products over here. Cyanamide, on the other hand, seems definitely to have entered the field, and there can be no question that the Federation has an arduous task in front of it, and will require the support of all producers if it is to maintain the splendid record which it established last year. The Federation now represents no less than 90 per cent. of the manufacturers in this country, and it is to be trusted that those who form the small minority will, before long, be imbued with more altruistic motives and cease to profit from conditions which, by reason of their standing aloof, they have no part in creating.

What is a Fine Chemical?

JUDGING by the widely divergent views expressed on the question whether santonine is rightly or wrongly included in the list of chemicals covered by Part I. of the Safeguarding of Industries Act, Mr. Cyril Atkinson's office will be no sinecure. Usually, where the reference in an Act is clear or where the experts agree on the guiding principles to be applied, the trained legal mind has little difficulty in deciding. But the feature of the present position in reference to santonine is the absence of agreement on facts or principles. If the Act had provided that no chemical should be imported free which competed with an actual or prospective British industry, the application of such a test would have been comparatively simple. Though that presumably is the real purpose of the measure, the Act itself does not say so. In the case of santonine, such a definition would probably have been conclusive, for santonine is grown and extracted in the East; there is no British industry in the drug or chemical—whichever it is—natural or synthetic, nor is there any serious prospect of such an industry being established. There being no British industry, what is there for the Act to safeguard?

Santonine, however, has been included in the list as a fine chemical. What is a fine chemical? The experts cannot precisely say, nor can an agreed definition be found in any dictionary. The widely differing and all more or less elastic definitions offered tend rather to confuse than to simplify the issue. The Board of Trade, it is suggested, have decided to treat as fine chemicals all except heavy chemicals, but here the dividing line is also uncertain. "Fine" and "heavy" are trade terms, which serve well enough for ordinary business transactions, but are insufficient for official decisions. Equally inconclusive are the distinctions between "refined" and "coarse"; one might almost as well accept the suggestion of a humorist that anything sold by the ton is heavy and anything sold by the ounce fine. It is frankly admitted among experts that probably no two persons would agree on the point, and in such circumstances the referee deserves sympathy.

The only approach to some guiding principle is supplied by analogy. Minerals the Board of Trade have ruled out. Why, then, include vegetables? Santonine is extracted from a plant; it is not brought into existence by any chemical process, nor is it used as a chemical reagent. But, it is argued, the extraction of the drug from the plant requires such a degree of chemical process as to constitute the final product a fine chemical. Mineral ores, however, require a considerable amount of chemical treatment before the pure product is obtained. Why not treat both, one way or the other, on the same principle? We give the conundrum up, and await with real interest the referee's solution.

Defining a Chemist

A CORRESPONDENT puts to us a short catechism on the Pharmacy Acts Amendment Bill, a private measure noticed briefly in THE CHEMICAL AGE of November 19. To his first question: "What is a chemist within the meaning of the Act?" the answer is "Any person who, after January 1, 1925, passes the qualifying examination of the Institute of Chemistry and obtains the Institute's certificate of 'competent skill, knowledge, and qualification.'" How would the Bill, our correspondent asks, affect all those chemists who are not members or associates of the Institute of Chemistry? It is difficult to say precisely, but presumably existing practitioners, although not academically qualified, would be recognised as chemists *de facto*. After the passing of the Bill, the prescribed qualifications would apply to all new-comers. Could you, our correspondent continues, also give information as to the number of members and associates by examination, and the number of members and associates without examination of the Institute. Roughly the membership of the Institute is 4,400, and about half are qualified by having passed either the associateship or the fellowship examination of the Institute. It would, however, be an error to assume that the other half are unqualified by examination. If they have not passed the Institute's own examinations, they have passed examinations which are accepted by the Institute as the equivalent of its own. We are not able to state the membership of the British Association of Chemists and the National Association of Industrial Chemists.

The Bill, as we indicated in our previous reference, though it deals with this important question of definition, must not be taken too seriously. The Pharmacy Society, upon which it proposes to confer powers

corresponding to those of the Institute, must not, of course, be confused with the Pharmaceutical Society. The Institute, it may be added, desires to dissociate itself from the Bill.

Canadian Chemical Industry

THE "Directory of Chemical Industries in Canada," just issued by the Dominion Bureau of Statistics, Ottawa, is an excellent example of national commercial publicity. In 1918 the Bureau, at the request of the Honorary Advisory Council for Scientific and Industrial Research, undertook a special survey of Canadian chemical industries, one purpose of which was to provide a directory of such industries and their products for the use of the trade. The first edition of this directory, published in 1919, contained the names, addresses and chemical products of nearly 500 Canadian concerns, operating over 600 plants in various parts of the Dominion. The present edition is designed to meet a considerably increased demand, and at the same time to present a more comprehensive review of these industries than was possible within the time available for the preparation of the first edition. Altogether the number of firms listed has been increased to 818, and the number of plants operated to 1,002. The directory follows the plan adopted in the first edition under which the information is presented in two sections: (1) an alphabetical list of the various concerns, the head office address of each, the location of branches where such exist, and a detailed list of the products of each, including in the latter both chemicals and products resulting from chemical processes; (2) a list alphabetically arranged of the chemical products manufactured in Canada showing the names and addresses of the various concerns engaged in the manufacture of each.

The carrying out of this survey has been under the direction of Mr. S. J. Cook, B.A., A.I.C., chief of the Mining, Metallurgical and Chemical Branch of the Bureau which, it may be added, is now engaged in bringing out an annual series of reports on individual groups of chemical industries, as well as a summary of the chemical industry as a whole.

Certificates in Chemistry

AT the invitation of the Board of Education, the Institute of Chemistry is undertaking arrangements for the award of national certificates in chemistry to students in technical schools and colleges in England and Wales. The Institute, in conjunction with the Board, is prepared to approve schemes of study submitted by technical schools or colleges for the award of such certificate, relating to courses in chemistry conducted under approved conditions. It is intended to have part-time and full-time courses. The full-time courses will be suitable for students who have attended a secondary school up to the age of 16 years and certificates will be granted in chemistry and in applied chemistry. Admission to the course in applied chemistry will be restricted to students who have satisfactorily completed a full-time or an advanced part-time course in chemistry or other approved studies. The full-time course in chemistry must extend over at least three years, while for that in applied chemistry at least one year will be required. Any inquiries on this subject may be addressed to the Registrar of the Institute, 30, Russell Square, London.

Points from Our News Pages

The subject of "Dissolved Gases in Water" is dealt with by a contributor who describes the tests employed for determining the quantities present (p. 694).

The mechanism and industrial applications of Plauson's colloid mill are described and discussed by a technical correspondent (p. 696).

An article by S. J. Cook on the future of Canadian chemical industries describes the conditions during the reconstruction period and the opportunities for development (p. 698).

Witnesses before the Referee under Part I. of the Safeguarding of Industries Act offer opinions on the question whether santonine is properly included in the list of dutiable chemicals (p. 697).

Mr. D. Milne Watson, in his address at the meeting of the British Sulphate of Ammonia Federation reviews the work accomplished during the first year (p. 700).

The Institute of Chemistry issues an official notice dissociating itself from the Pharmacy Acts Amendment Bill (p. 703).

The Board of Trade Committee appointed to hear complaints under Part II. of the Safeguarding of Industries Act, 1921, will hold its first sitting for the taking of evidence on December 12 (p. 703).

The directors of several nitrate producing companies, while agreeing that a revival is not imminent, predict a great future for the nitrate industry, especially when the need for nitrogenous fertilisers is more fully appreciated by agriculturists (p. 704).

New branch offices in Glasgow are being opened by Messrs. Chas. Page & Co., Ltd. (p. 706).

The features of our market report this week are a fairly active demand for chemicals and a slight improvement in the volume of business.

Books Received

RAYS OF POSITIVE ELECTRICITY AND THEIR APPLICATION TO CHEMICAL ANALYSIS. By Sir J. J. Thomson. Second Edition. London: Longmans, Green, & Co. Pp. 237. 16s. net.

DICTIONARY OF BRITISH SCIENTIFIC INSTRUMENTS. Issued by the British Optical Instrument Manufacturers' Association. London: Constable & Co., Ltd. Pp. 335.

APPLIED CALCULUS. By F. F. P. Bisacre. London: Blackie & Son, Ltd. Pp. 446. 10s. 6d. net.

THE DISTRIBUTION OF GAS. By Walter Hole. Fourth edition. London: Benn Brothers, Ltd. Pp. 699. 50s. net.

GENERAL REVIEW OF THE CONDITIONS AND PROSPECTS OF BRITISH TRADE IN INDIA. By Mr. Thomas M. Ainscough. London: H.M. Stationery Office. Pp. 362. 5s. net.

The Calendar

Dec.		
5	Society of Chemical Industry (London Section). 8 p.m.	Burlington House, Piccadilly, London.
6	Hull Chemical and Engineering Society: "Vat Colours." W. Thevenaz. 7.30 p.m.	Wilberforce Café, Waterworks Street, Hull.
7	Industrial League and Council: "Some Problems of Unemployment." Mr. John Baker. 7.30 p.m.	Caxton Hall, Caxton Street, London.
7	Society of Chemical Industry (Newcastle-on-Tyne): "Chemical Works Organisation." W. B. Davidson.	Armstrong College, Newcastle-on-Tyne.
7	Society of Public Analysts ..	Burlington House, Piccadilly, London.
7	Royal Institute of Public Health: "Lead Poisoning in Industry." Sir Kenneth Goadby. 4 p.m.	37, Russell Square, London.
8	Chemical Society: Lecture by Professor J. W. Gregory. 8 p.m.	Institution of Mechanical Engineers, Storey's Gate, London.
9	Society of Dyers and Colourists (Scottish Section): "Dyestuffs." W. M. Cummings.	Glasgow.

Dissolved Gases in Water Supplies

The writer discusses the various gases which are normally contained in natural water supplies, and briefly describes the tests employed for determining the quantities in which they are present.

THE more prominent of the gases contained in normal or natural water supplies are nitrogen, oxygen, and carbon dioxide. The origin of these gases is not far to seek. Their presence is primarily due to absorption from the air, as, in passing through the atmosphere, rain water falls in a fine state of division, a large surface being exposed, these being optimum conditions for gas absorption.

The following table gives the solubility coefficient of the three gases.

TABLE NO. 1.

Coefficient of Solubility. That is, the volume of gas absorbed by 1 volume of water at 760 mm. pressure.

	15°C.		20°C.
Nitrogen	0·0148	..	0·0140
Oxygen	0·0299	..	0·0284
Carbon Dioxide ..	1·0020	..	0·9014

In surface water the carbon dioxide varies considerably during the year, due to variation in temperature (*Zeitsch. f. Hygiene* 6, 1889, *p.* 186. *De Giaxa*).

Nitrogen in the free state does not appear to remain in water for any length of time, bacterial action taking place, converting the nitrogen into ammonia and then into nitrates and nitrites.

The presence of certain gases in water plays an important part in its activity in Nature. Immense transformations were brought about in the early period of the earth's history through the agency of weak solutions of oxygen and carbon dioxide. It appears to be Nature's powerful destructive agent and solvent in the moulding of the earth's surface and also in the production of cavities in the earth's crust, with the incidental formation of stalactites and stalagmites. Of these latter, prominent examples are those of Salzburg in Germany, Derby Hills and Cheddar in England. The formation of these natural pillars is entirely due to the disintegration, solution, and subsequent precipitation of various salts, chiefly those of calcium, due to the purging and solvent action of moving water saturated with carbon dioxide and oxygen. In fact, geologists estimate that 300 tons of chalk could be carried away annually from a square mile of surface by these means.

The major portion of the dissolved carbon dioxide in the Thames is combined with $CaCO_3$ as bicarbonate. It has been shown by Hillmann's and Heublein (*Gesundheits-Ing*, 1912, 35, p. 669) that soft water containing free CO_2 is a much more active solvent of calcium carbonate than a hard water containing a similar amount of free CO_2. Gases, more especially carbon dioxide, are often found in the earth's strata, under great pressures, enabling percolating waters to become highly charged, when these waters convert carbonates into the more easily soluble bicarbonates.

Natural aerated water will contain about 20 c.c. of dissolved gases per litre, composed of :

65 per cent. Nitrogen.
30 „ „ Oxygen.
5 „ „ Carbon Dioxide.

In normal water supplies the ratio of combined nitrogen to oxygen is remarkably constant, being in the vicinity of 2-1. Water supplies which have a lower ratio of oxygen are to be regarded with suspicion. The presence of decayed matter soon changes this balance, the oxygen being utilised during the course of organic degradation.

Large areas of exposed water usually suffer gas saturation by natural means, that is, cascades, falls, rapid movements due to floods at change of seasons and tidal activity. Deep waters are probably saturated by means of " streaming action " consequent on surface layer concentration of salts, the occluded gases becoming submerged due to a local and temporary increase in density.

It has been suggested that the solution of atmospheric gases is brought about by " diffusion," but the rapidity of uniformity of solution of gases in large tracts of water is contrary to theory.

A water supply may contain dissolved oxygen much below the degree of saturation, due to the presence of matters which are capable of being oxidised at ordinary temperatures. This is often found in the vicinity of mining areas, and such a supply is quite out of the question as a potable water, and incapable of supporting fish life.

Dissolved Oxygen

Some authorities assume that the absence or a low degree of dissolved oxygen is direct evidence of the presence of decomposing organic matter. This could only apply to shallow water, as Dittmar has shown that on analysing water samples taken at a great depth oxygen was found to be absent. Water free from dissolved oxygen appears to be objectionable for domestic purposes, possessing that property termed " flatness."

Together with being derived from the air, carbon dioxide is also produced during the putrefaction and degradation of organic matter in stagnant water.

The following gases are also occasionally met with : Methane, ethane, ethylene, and hydrogen sulphide. Waters containing these latter gases are termed sulphurous waters, and possess certain medicinal properties.

During the examination of a new source of water for a town supply it is imperative that the extent to which dissolved gases are present should be known, and is an important factor in determining the suitability of such water for potable purposes. Much valuable evidence as to the source of gases in water and tendency towards contamination may be obtained by a study of the topographical and geological aspects of the district.

The presence of certain gases gives a clue as to the history of the water, and also may show some evidence as to the type of contamination it has suffered. For example, water which is high in organic nitrogen or ammonia—which is one of its first decomposition products—is evidence of contamination with sewage or other refuse animal matters, or of having been in contact with decomposing organic matter. However, the absence of nitrogen in any form in water is no criterion of the suitability of the water for potable purposes, as the nitrogen may have been attacked and sometimes even entirely destroyed through bacterial activity. In this connexion it is of interest that the reduction of nitrogen in the form of nitrate to nitrite has been used in the United States of America as one of the five standard tests for Bacillus Coli. This bacillus, though not spore-forming, was found by Escherich (1884) to be a normal inhabitant of the intestinal tract of man and many other animals, and its presence is regarded as direct evidence of sewage pollution. Although Bacillus Coli may be decadent when isolated from the animal body, evidence of recent pollution is always forthcoming if present in any quantity.

Nitrogenous Matter

Nitrogen in the gaseous state is seldom found in water, as, although dead tissues and broken-down cells of both animals and plants, as well as domestic effluents, find their way to the soil, the nitrogenous matter is transformed through the agency of bacteria. These decompositions are usually of a very drastic and complicated nature; for example, urea is converted into ammonium carbonate, then further oxidised into nitrites or nitrates, finally forming the complex albuminoid molecule. Classic researches in connection with the complete cycle of organic nitrogen in water supplies

have been carried out by Sedgwick (*Journal of the New England Water Works Association, Vol. IV., Part* 1, a monumental work worthy of more attention).

Estimation of the Dissolved Gases

The sample should not be allowed to stand any length of time between its collection and analysis. This is important, as Treadwell has shown (*Chem. Unter. des Schwef. von Baden, Kanton Aargau*, 1896) that the same water, being analysed immediately on collecting and after standing two years, showed the following differences :

	Immediately.	After 2 Years.
Oxygen	10.8 ..	14.8
Carbon Dioxide ..	8.5 ..	0.4

The total gases are best determined by a method of Richardson (*J.S.C.I.* 1919, 38, 32-33 *T.*), where the gases are actually extracted and measured. A bottle is fitted with a stopper and separating funnel, and the whole completely filled with water. The contents of the body of the funnel are poured out and the funnel exhausted. The funnel is now connected with the water in the bottle, which is warmed to 40° C. The water will boil, expelling all gases, which are collected and measured.

An ingenious apparatus for sampling water highly charged with gases is given by Hackl (*Chem. Zeitung* 1919, 43, *p.* 421-422) in an article of considerable interest in connexion with gases in water supplies.

A convenient method for determining oxygen is that of Winkler (*Berichte* 39, 2,069, 1896), where a quantity of water is heated in the presence of manganese hydroxide, forming manganous acid, the oxygen being determined by titration of the liberated iodine on addition of potassium iodide and a mineral acid.

1 gr. at. Iodine = 8 gr. = 5,597.8 c.c. Oxygen at 0° C. and 760 mm. pressure.

Marty and Winkler found this method to have remarkable agreement with a simple analysis of the gases obtained on exhausting the water itself.

This figure must not be confused with the oxygen value, which is the amount of oxygen necessary to oxidise the organic and other oxidisable matter in an acidified solution of the water.

Carbon Dioxide and Nitrogen

To estimate the free carbon dioxide in water, a simple and accurate method is that of Czensny and Zlut (*Ber. deut. pharm. Ges.* 1919, 29, p. 344-359. *Zeit. anal. Chem.* 1919, 58, *p.* 1) 100 c.c. of water are titrated with a solution containing 2.6525 grams sodium carbonate and 2.5 grams phenol phthalein, potassium sodium tartrate being added to thwart any action due to iron salts. The m.grs. of free CO_2 is found by multiplying the number of c.c. of the titration solution by 1.22 after deducting 0.52 c.c.

An estimation of free nitrogen is of little value consequent on bacterial activity, and resort must be made to a determination of the total nitrogen in the combined state, viz., ammonia, albuminoid ammonia, nitrate and nitrite.

The ammonia is determined by successive Nesslerising, and the nitrates and nitrites by reduction methods, the details of which are given in any standard work on water analysis. The reader is also referred to original papers, contributed to the Journal of the Chemical Society by Dittmar and Robinson and also Dupré and Hake. Methane, ethane, and sulphuretted hydrogen are only found in abnormal water supplies, and the method adopted for their analysis must be co-related to the degree to which they are present after a preliminary analysis.

Some fluctuations take place in the amount of dissolved gases contained in a natural water, there being a marked difference in composition at various seasons.

The source of much of the nitrogen present as ammonia is the sea, especially during high winds, industrial pollution of the air, and the soil. Russel and Richards (*J. Agric. Sci.* 1919, 9, *p.* 309) state that the maximum amount of ammonia is found during the time of highest biochemical activity. The authors are also of opinion that the increased modern use of gas for heating and illuminating purposes has a marked tendency towards producing oxides of nitrogen rather than ammonia. This will have a direct bearing on the nitrogen content of water. It is also suggested that the rate of condensation at high altitudes of water evaporated from the soil may vary considerably during seasonal transitions.

A British Firm's Success

Important Australian Boiler Contract

THE firm of John Thompson, Water Tube Boilers, Ltd., Wolverhampton, may be congratulated on a success which is creditable not only to themselves, but to British industry. In the face of very keen international competition, especially American, they have secured a contract from the State Electricity Commissioners of the Government of Victoria, Australia, for the supply of twelve of their water tube boilers for the Morwell power station in the centre of a coalfield some 60 miles from Melbourne. The contract price is stated to be about £280,000.

All the twelve boilers will be " Thompson " patent straight vertical water tube boilers, with a working pressure of 260 lb. per sq. in., each capable of evaporating 70,000 lb. of steam per hour, and fitted with superheaters to superheat the steam to a final temperature of 650° F. Each boiler will be fitted with three underfeed forced draught travelling grate stokers to burn Morwell brown coal. This coal is found practically on the earth's surface and the power station is being erected adjacent to the fuel bed, and is for the purpose of supplying power to Morwell and district. The boilers will be complete with chimneys, flues and automatic soot and ash extracting and disposal plant. The contract has been secured on price and design, and a factor in bringing it to England has no doubt been the present high cost of production in the United States.

The Italian Soap Trade

BEFORE the war Italy imported about 6,000 tons of common soap and exported about 3,500 tons, whilst the imports and exports of toilet soap just about balanced each other in the neighbourhood of 200 tons. Since the war the exports of common soap (in 1919 and 1920) have exceeded the imports, but with toilet soap the case is reversed, as the following figures show :

	1919.	1920.	1921. (5 *months.*)
Common Soap.			
Imports (tons) ..	5,172	5,690	2,859
Exports ,, ..	4,917	6,140	918
Toilet Soap.			
Imports ,, ..	808	730	82
Exports ,, ..	401	230	65

The chief customers for the common soap in 1920 were Austria, Jugo-Slavia, Czecho-Slovakia, and Eritrea. This common soap, which is chiefly olive oil soap, is also exported in small quantities to the United Kingdom and to the U.S.A. Recently, however, the U.S.A. has been increasing its imports of olive oil and reducing its imports of olive oil soap, which is now being made in increasing quantities in the States. The exports to Spain have also fallen off considerably, owing to the fact that the manufacture of soap, especially Castile soap, is being extended in that country, for which purpose new factories have been recently erected.

French Pharmaceuticals

THE Sealand Trading Co., Ltd., Buchanan Buildings, 24, Holborn, London, announce that they have been appointed sole agents for the United Kingdom for the preparations of Dr. B. Kritchevsky, Paris (" Sanogyl," a dentifrice intended to prevent and to cure mouth infections, and " Sanoram," a powerful antiseptic, prepared in the form of tablets), and Dr. Besredka, Paris (tuberculous egg-prepared antigen for diagnosing tuberculosis, and anti-dysenteric and galled anti-typhoid tablets, by which, it is claimed, the effects of vaccination can be secured). The preparations (of which samples are forwarded) appear to be of a highly-refined quality, and are very neatly packed.

A Revolution in Rubber Technology?

Possibilities of the Colloid Mill

If the claims which Plauson makes in connexion with his colloid mill are substantiated it would seem that revolutionary developments may be looked for in a number of industrial processes. Our contributor discusses below some of the applications of the invention.

DURING recent years the terms "colloid" and "colloidal" have almost become an obsession, and threaten to dominate the whole world of chemistry to a disproportionate degree; and if the extraordinary claims put forward on behalf of Plauson's colloid mill are not exaggerated this comparatively simple little piece of mechanism seems destined to add still further to the prestige of the colloidal state. These claims are numerous and far-reaching, and some of them, already forming the subject of numerous patent applications in this country by the Plauson Förschungs Institut, will be referred to later. Meantime the important field of rubber technology has been claimed by the colloid mill as one of its latest and most brilliant achievements.

So long ago as 1905 experiments had been carried out in Germany to test the colloidal action of rubber on selenium and the effect of adding to the rubber substances in a colloidal state; but it was almost impossible, at that date, to get inorganic matter in a colloidal condition, although it was clearly recognised that, if this could have been accomplished, the process of rubber manufacture would be greatly facilitated. In other words, it was well known that the most important condition for satisfactory mixing is the utmost possible degree of fineness in the ingredients combined with perfect dryness. But the utmost fineness then possible was 0·01 mm., and this is not nearly fine enough for best quality durable rubber. It is now asserted that the requisite degree of fineness (0·001 to 0·00001 mm.) can be obtained by means of the colloid mill invented by Hermann Plauson, which not only grinds rubber to this degree of fineness but also the other substances used in rubber manufacture—litharge, magnesia, zinc oxide, graphite, kaolin, &c. It is thus possible to obtain a perfectly homogeneous mixture instead of, as heretofore, a mere conglomeration. Moreover, practically all the various fillings incorporated with the raw rubber act now as vulcanising accelerators owing to the high degree of dispersion, and larger proportions of such fillings can be added without prejudice to the elasticity of the manufactured rubber. And the manufacture of coloured rubbers is much improved, since the various dyes can be incorporated with better effect in a colloidal state, whilst the amount of dye required is reduced. Other advantages are that the rubber is much more resistant to mechanical wear and tear; colloidal sulphur is more easily and effectively incorporated than crystalline sulphur, thus giving a better product and inhibiting the formation of free sulphuric acid. Finally, the regeneration of old rubber is greatly improved.

Plauson's Results

Further work with the colloid mill in connection with rubber manufacture is being carried out by the Tribuswerken A.G. at Tribuswinkel bei Baden. During the last year or two the German chemical press has devoted considerable space to Plauson's colloid mill, the principles on which it is based, and the wonderful possibilities claimed for it. The best account is probably that given by Plauson himself in a series of articles in the *Chemiker Zeitung* about a year ago. After much "colloidal" talk, he says that he began in 1911 certain experiments to determine the optimum conditions for obtaining dispersoids of the highest degree by mechanical means, the substances used being coal, talc, graphite, &c.; but with the grinding mills then available it was not possible to obtain a fineness beyond 0·008 mm., even with wet grinding. In 1912 he designed a modification of the ordinary druggist's "Perplex" beater mill, fitted with a stuffing box to make it watertight. This mill was run at a high speed, and Plauson claims to have obtained a fineness of 0·0001 mm., using water as the disperse medium. Certain substances, acting as protective colloids, added to the medium improved the result, *e.g.*, alkaline solutions of glue and certain albuminoids (lysalbic acid and its salts) when grinding coal. Tannin in graphite grinding, neutral soap solution in talc grinding, and glycerin or glycol in grinding sulphur, &c., greatly facilitate matters. Inhibitive substances such as acids and electrolytes must be removed from the disperse medium by washing or a larger proportion of protective colloid must be added.

The colloid mill is manufactured by the Maschinenfabrik Emil Passburg, of Berlin. A patent was applied for in 1914, and German patent No. 289,026 was granted in 1916 in the name of Georg Hanning, of Hamburg, but it is understood that further improvements have been made since then, and doubtless some of these will be disclosed in the pending applications of the Plauson Förschungs Institut.

Liquid Coal

Among the various industrial applications of the colloid mill may be mentioned, first of all, the manufacture of what is called "liquid coal," which, being a liquid fuel, has considerable advantages over solid coal. It is estimated that there are in Germany about 400,000 tons of tar oils available, but before the war only about 45,000 tons of tar oils were used for motors, and it would be in any case very convenient to supplement the supplies of liquid fuel with a colloidal preparation of coal in water or tar oil. Such a preparation can be obtained by means of the colloid mill, and numerous advantages are claimed for it.

In the petroleum industry, as is well known, the crude naphtha is first run into large channels or valleys, forming the so-called naphtha lakes. When the liquid naphtha is afterwards pumped out there remains a sludge containing from 10 to 50 per cent. of oil which cannot be recovered by distillation owing to fire risk and the high cost of heat. A sample of this sludge, containing about 25 per cent. of naphtha, was sent to Plauson, and it was found that the naphtha could be easily recovered by means of the colloid mill, and it is claimed that this method will enable many low grade mineral oils in Germany to be usefully exploited, especially shale oil.

In reducing the proportion of residual oil in oilcake, fuller's earth, &c., the colloid mill, it is claimed, finds another useful field, and provides a much simpler and more efficient method than the ordinary steam-blowing. With the addition of emulsifying agents, emulsoids are formed which separate readily on standing if strong acid be used, and the oil content may be reduced from 8 or 10 per cent. down to 0·8 or 1 per cent. Resins also may be emulsified in like manner, using water as medium with 1 or 2 per cent. of resin solvent. A very good yield of pure resin is thus obtained.

Other possible applications of the new colloid mill may be found in soap manufacture, fat-hardening (hydrogenation of oils), the manufacture of lamp-black, colloidal wood and straw, graphite, and in facilitating chemical reactions generally. Some rather extraordinary claims are made in connexion with fat-hardening, namely, that time or temperature may be reduced and the process much simplified by doing away with the ordinary nickel catalyst and coating the revolving parts of the colloid mill with nickel or palladium or other catalytic metal. It is not stated how the hydrogen is introduced or how the catalyst is replaced or regenerated.

Is Santonine a Fine Chemical?

First Appeal against Official List

MR. CYRIL ATKINSON, K.C., the Referee under Part I. of the Safeguarding of Industries Act, held his first inquiry on Saturday, November 26, in regard to a complaint that Santonine has been improperly included in the list of goods upon which import duty should be paid. The parties concerned were the Russian Trading Co. and the Chemical Merchants' Committee of the London Chamber of Commerce, who were represented by Mr. Swan; the Board of Trade were represented by Mr. Whitehead. The case put before the Referee was that Santonine was a drug and not a chemical, and therefore did not come within the list.

Mr. Swan explained that Santonine is extracted from flower heads which are grown in Southern Russia and Turkestan almost exclusively. The supply of Santonine was controlled by a Russian company, and it had never been made anywhere else so far as he knew. The case, continued Mr. Swan, would depend upon the definitions of the terms chemical, organic, and fine. His argument was that even in the view of the Board of Trade Santonine could only fall under the heading of "fine chemicals," but nobody had ever regarded Santonine as anything else than a drug, and it was never referred to as a chemical at all. It was known as a bitter principle, and was extracted from the worm-seed or flower-head by a very simple process. The properties of Santonine had been known for many years purely as a drug. Its use was a purely medicinal one, and it had no chemical properties whatsoever. Santonine was, he said, an organic compound and not a synthetic one, and therefore was excluded from the first group in the part of the Schedule to which he had referred; it was not an analytical reagent, and his submission was that anything coming into the third section of the part of the Schedule in question, viz., "all other fine chemicals," must be something which was formed by the interaction of things in Section 1 and 2 of the part of the Schedule to which he had referred. All the evidence went to show, so far as chemical literature was concerned, that fine chemicals were regarded as distinct from alkaloids, essential oils, extracts, and medicinal preparations and drugs, so that Santonine, being a drug, as it undoubtedly was, could not be brought within the definition of fine chemicals. His case was that they could not define "fine chemicals" without reference to the previous parts of the section of the Schedule, and as Santonine was not a synthetic product, therefore it could not come within the Act, if his interpretation was the correct one.

The Extraction Process

Mr. J. E. Parry, analytical consulting chemist, said he had made a study of the classification and nomenclature of chemicals, and any definition put forward must be subject to certain reservations, and no two people probably would agree. The process of extraction was to mix the seed with milk of lime, get rid of the vegetable matter, which was about 98 per cent., by means of filtration, leaving the resinous matter in solution from which it was extracted by treatment with hydrochloric acid. It was a simple extraction process which could be left in the hands of a skilled workman. Santonine could not be made synthetically because its constitution was not yet known. It was true that a formula had been given to it, but the atoms might be combined in a hundred different ways, and at present there was no possible method of synthesis. Obviously if it could be synthesised it would immediately fall into Group 1 of the part of the Schedule relating to chemicals. In the commercial sense, by the word "chemical" was meant a body which had either been brought into existence by chemical action or was used as a chemical reagent. Santonine was neither. His own view of a chemical was that of something which was artificially produced, in the sense that chemical processes were necessary to its production.

Mr. Whitehead then put a number of questions to witness purporting to show that the process of extraction of Santonine from the flower-heads is not a simple process, and that the Santonine is, in fact, converted into something else in the process and reconverted again.

Mr. Parry said that was merely for the sake of convenience. The Santonine could be extracted directly without converting it. He had never heard Santonine called a heavy chemical. As to the synthetic manufacture of Santonine, he could see no chance of it being made in that way in the near future.

Mr. S. Salamon, analytical consulting chemist, supported the evidence given by Mr. Parry, and gave as his definition of fine chemicals, according to the Schedule, that they were not replicas of naturally occurring products. He did not think any definition of a chemical could be complete. Santonine had never, to his knowledge, been regarded as a chemical but as essentially a drug.

Constitution of Santonine

The first witness for the Board of Trade was Dr. J. J. Fox, superintending chemist of the Government Laboratory, who said he would certainly regard Santonine as a fine chemical. The chemistry of it was perfectly well known, as also was its constitution. There was quite a reasonable hope of making it synthetically from coal tar or similar products. It was quite incorrect to say that a drug could not be also a chemical, as there were dozens of drugs which were also chemicals. Quinine sulphate was a fine chemical, but it was unquestionably a drug. Further, in speaking of Santonine as an extract, he wished to draw a strong distinction between an extract and a thing that was extracted, and in that sense Santonine was not an extract. As to a definition of a chemical, he would say that it was a material obtained from elements, or in combination with other elements, which is capable of entering into reaction with other bodies. He did not agree that Santonine was obtained in the form in which it existed in the worm-seed, as it was converted in the process of extraction. He would not call the process a simple one.

Mr. F. H. Carr agreed with the description of the process of extraction of Santonine that had already been given, but he would not care to leave it in the hands of workmen. It required skilled chemical supervision all the time. He would define as a fine chemical anything which did not come within the definition of a heavy chemical.

Views of the Board of Trade

Mr. J. F. Ronca, Principal Staff Officer to the Department of Industries and Manufactures of the Board of Trade, said it was decided in drawing up the list that a chemical should be regarded as a prepared substance, and that, generally speaking, it was a single identity so far as substance was concerned. They had no rigid definition, and therefore the qualifying words in the Schedule were used. For instance, there was barium sulphate; barytes, however, was the mineral from which it was made, and they did not regard barytes as a chemical. The Board had not scheduled any product which was a mineral. There were many materials which had a definite identity which were prepared products, but they were not used on account of their reactive properties, but more by reason of their structural utility, such as plaster of Paris and Portland cement. The Board realised that the term "fine chemical" was not a scientific term. It was generally used to cover all chemicals which were not heavy chemicals; but the Board had regard to the processes involved in its production. If it were a process which could be left almost entirely to skilled workmen without chemical supervision all the time the probability was that it was a heavy chemical, but if it wanted a substantial amount of chemical supervision the probability was that it was a fine chemical. They also took into consideration the purity of the product and the quantities used, although this latter was not a great point, because there were some heavy chemicals which were extraordinarily pure, and there were some fine chemicals which were very impure. It was not thought that the price helped very much except that it was an index of the amount of supervision which was necessary. The real difficulty was in connexion with mineral substances. For instance, borate of lime had been prepared artificially for certain special purposes. At the same time thousands of tons of borate of lime came into the country from South America; the Board were of opinion that they could not cover crude ores and crude minerals, and therefore they had to consider a definition which took account of the amount of work involved in the preparation of the substance. It was a matter of degree, but he thought the amount of preparation involved with Santonine brought it within that definition of a fine chemical.

It was again brought to the notice of the Referee that some natural products had been excluded from the List, and the inconsistency was commented upon. For instance, menthol was included but natural camphor excluded.

Mr. Ronca said they now had evidence to show that there were chemically prepared varieties of menthol coming into the country, and it was proposed to put an R against menthol in the List, meaning that it was pure and not synthetic.

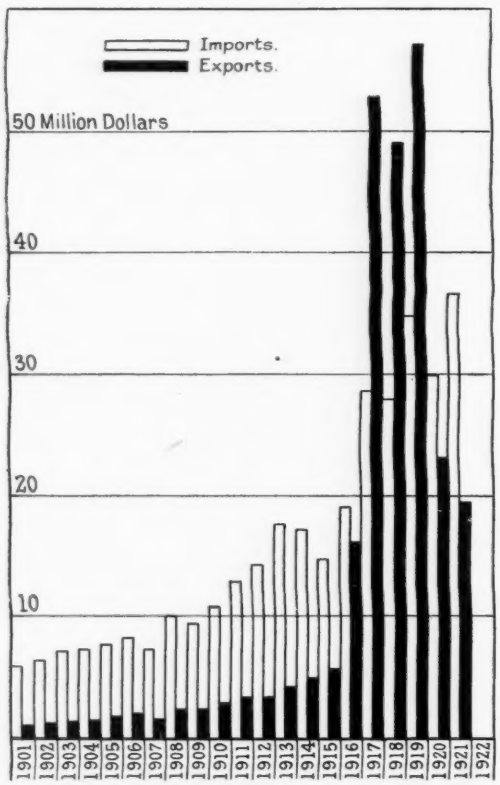
The inquiry was adjourned until yesterday (Friday).

The Future of Canadian Chemical Industries

By S. J. Cook, B.A., A.I.C.

The following notes on Canadian chemical industries in there construction period and the opportunities for chemical progress are contributed by Mr. Cook, the Chief of the Mining, Metallurgical, and Chemical Branch of the Dominion Bureau of Statistics, to the "Directory of Chemical Industries in Canada" just issued by the Bureau.

CHANGING conditions following the war have been reflected in the chemical industries of the country much as in other industrial activities throughout the Dominion. The most noticeable falling-off of the industries with which industrial chemistry has to do, has been, of course, in munitions. The efficient way in which the Imperial Munitions Board built up and maintained this group during the war has been cause of much favourable comment. With the armistice, however, the need for their products collapsed, the various plants were closed, and in many cases were immediately dismantled and sold. Raw materials stocked by these concerns were thrown on the market, and for a time the glut thus produced caused established and permanent industries much concern. That period, though trying, has come to an end, and market conditions are becoming more settled and trustworthy.



IMPORTS AND EXPORTS OF CHEMICALS AND ALLIED PRODUCTS DURING THE FISCAL YEARS ENDING MARCH 31, 1901-21. PREPARED BY THE DOMINION BUREAU OF STATISTICS.

The firms continuing to manufacture explosives are in several instances expanding their interests, and are going into the manufacture of fine chemicals on a modest scale. Medicinals are still being produced, but the prospects are somewhat uncertain in this field. The paint and varnish industry is advancing by leaps and bounds, and shows every prospect of becoming one of the most successful of Canadian developments. In wood distillation there is much room for advance, and laboratories will have plenty to do for some time. In the manufacture of pulp and paper, waste on a considerable scale continues through lack of intelligent scientific control of processes and plants. Greater interest in the conservation of the national heritage, and less improvident expenditure of resources are demanded. It is noted that where men of science gather, the discussion turns more and more towards conservation and economy rather than to the vastness of our natural wealth and its free expenditure.

Metallurgical Developments

The principal development in the metallurgical world has been the establishment and putting into operation of two large refineries to treat Canadian nickel, which heretofore has been shipped out of the country as matte to be refined in the United States or Great Britain. The refinery of the International Nickel Company of Canada at Port Colborne, Ontario, is now producing pure nickel in ingots or shot, and nickel oxides. The plant at Deschenes, Que., owned and operated by the British America Nickel Corporation, using the Hybinette electrolytic process, commenced operations during March, 1920. The establishment of these plants is a matter of satisfaction to those interested in the development of Canadian industries to the point where they are able to manufacture for home use or export finished products from raw materials obtained in the country.

The development of cheap electrical power has contributed notably to the advance of industries using electro-thermic reactions, and it is predicted that the use of the electric furnace in the manufacture of steel will be greatly increased within the next few years. During the war considerable quantities of low phosphorous pig iron were thus made, and the manufacture of aluminous and silicon carbide abrasives is now an established industry. The intense heat which it is possible to develop by electrical means is a factor the true value of which as yet can only be imagined.

Industrial chemistry as a science is the product of recent years. In America its greatest advance has undoubtedly been during the past fifteen years, due mainly to the endeavours of such workers as the late Robert Kennedy Duncan, a graduate of a Canadian University, whose activities led eventually to the establishment of the Mellon Institute at Pittsburgh, which has done so much to popularise the science of chemistry by magnificent successes won in the industrial field.

The years of the war added quickly to the development of science, and in this country, as in others, chemists responded to the national call by creating and perfecting processes for the production of chemicals needed in the prosecution of the war. The work done at Shawinigan Falls, where the world's largest acetic acid plant was completed and put into commission as a war-effort, needs no mention here. Many chemicals formerly entirely imported from Germany are now made in Canada on an ever-increasing scale and in a high state of purity Magnesium, refined nickel, aluminium, aluminous and silicon carbide abrasives, ferro-silicon and other ferro-alloys, picric acid and soda ash, are names of Canadian products the mention of which recalls war-time effort and notable achievement.

Increased Appreciation of Chemistry

The fundamental nature of chemistry is only now coming to be thoroughly appreciated by chemists themselves, and it is natural that the public should lag behind. Professor Henderson of Cornell, speaking at the Fifth National Exposition of Chemical Industries in Chicago, made this significant statement: "Every form of energy in Nature, with the exception of waterpowers, had its origin in a photochemical reaction." The systematic application of organised knowledge to the control and industrial development of every form of energy in Nature—for our waterpowers give us our electrochemical processes—is a job big enough to provide every chemist with considerably more work than he is likely to get done during his lifetime. There is no lack of work, but there is lack of knowledge and a consequent lack of appreciation of the many opportunities which are to be found in this most promising field. The student, the graduate, the professor, the plant superintendent, the manager, the capitalist, the Government—each has opportunities. The problems confronting each are different, but are alike as resting upon the same foundation: the need for the systematic application of knowledge to the control of industry. It is

unfortunately true that chemistry is needed in many places where as yet that need is not recognised: here the opportunity exists to bring this fact home to those interested. Opportunities in industrial chemistry are only likely to appear to the true chemist. True chemists are both born and made. Only the man endowed with the creative instinct has the essential foundational equipment for the development of a great chemist. The next consideration is training. Professor W. Lee Lewis of Northwestern University has said: "In general, to develop an historical evaluation of the subject, good judgment and the creative instinct, is the purpose of any course in science." To men and women trained in these three particulars the world of industrial chemistry offers many opportunities. To the lack of historical evaluation of the subject is perhaps due the failure on the part of many to appreciate proportionate values, to see things in their true light as they stand in relation to the rest of the world's activities. The first step in any research is to study the literature, to find what has been done, in short, to get an historical evaluation of the subject.

Canadian Opportunities

What are the Canadian opportunities and how are they to be found? To begin with, a thoroughly accurate knowledge of the home market must be acquired before new industries can be developed with success. There are various agencies contributing to this knowledge in Canada at the present time. Data regarding production, imports, and exports of all commodities are regularly compiled for Canada by the Dominion Bureau of Statistics at Ottawa. Production statistics are issued annually—in some cases monthly; imports and exports, as compiled from Customs data, are printed monthly. Of interest particularly to chemists is the establishment within the past year of the Mining, Metallurgical and Chemical Branch of the Bureau, whose particular task is to collect, compile and publish data relating to the chemical and mining industries of Canada. These data will be found of value as a barometer showing the rise or fall of production and possibly as a guide to profitable new developments. A Research Institute, planned to combine the Mellon Institute scheme of industrial research with the Bureau of Standards field of endeavour, has been proposed. Several laboratories of the Federal Government Departments are doing investigatory work on Canadian natural resources, their utilisation and development, and from time to time records of the work done are printed for the information of the public. Chemists and industrial executives should study these Government publications, most of which may be had for the asking, and should offer helpful criticism to the officials in charge.

Co-operative Organisation

Another source of information still latent in Canada, but possible of considerable development, rests with the operators in each industrial group. Competition among the firms engaged in any one chemical industry in this country has often been defined to mean the safeguarding from all others in the same industry of all processes and new methods. The time has gone by when that system can no longer be regarded as enlightened. The best organised metal industry of the United States is probably copper, in spite of the fact that there is no formal association among producers. Regarding this almost ideal condition, the following quotation from an address given recently by one thoroughly conversant with the industry is illuminating:

> "The satisfactory situation in this industry (copper) has resulted from the transparency that has been produced in it. By transparency, I mean the excellent knowledge about all its affairs that is possessed by everybody, resulting from the withdrawal of all veils so that everybody can see through everything. The production is in the hands of a relatively small number of companies, and even the smaller of them are relatively large concerns. The controlling interests are fewer than the producing companies, but not so few that there is not sharp competition among them in the market. There is a perfect exchange of technical information, both through the medium of the technical press, the transactions of the societies, and interworks visits. If at one works some new improvement is developed, such as coal-dust firing, no effort is made to keep it a secret, but rather is there an *esprit de corps* which leads to the prompt spreading of the details and the adoption of the new method wherever advisable. There is a similar publicity as to the methods of accounting, operating costs, and financial positions. The industry has learned the value of prompt statistical information, and now co-operates as a matter of course in furnishing the data for it. Producing a metal that is generally in demand and for which there is no substitute, with conditions that have forced producers to resort to poorer and poorer deposits and to devise improved means permitting their profitable exploitation, the copper industry has escaped the burden of over-capitalisation. The industrial co-operation in the copper industry, developed naturally as it has and both tempered and stimulated by commercial competition as it is and should be, is so excellent that I am unable to suggest anything that should be done to improve it, except even better statistical information."

There is opportunity for Canadian chemical industries to get together along similar lines.

There are at least two methods of determining where practical industrial opportunities exist in chemical lines; first, from the statistics of imports, which show the quantity and value of specific commodities imported; second, from a study of plant conditions and the observation of where economies may be effected. The first principle of industrial chemistry is the elimination of waste, both of materials and energy. It does not follow, of course, that where there is present waste, saving may be immediately effected, but it is true that when wasteful methods have been discarded, increased production results without corresponding expenditure of time and effort; when this has been accomplished it is possible to increase concentration on processes and thus further to add to the possible maximum of production.

Wherever there is waste in our industrial chemical world, it may be traced to (1) failure of the management to put the plant under adequate chemical control; (2) lack of initiative and training on the part of the chemist in charge; or (3) inability to market the by-products because of economic conditions beyond the control of the management. The elimination of waste from the first two causes ought to be immediately possible.

Everywhere in Canada the opportunity for expansion in lines requiring the application of the principles of chemistry, electro-chemistry and metallurgy, is unlimited. The needs are for scientific men with the knowledge, imagination and energy proportionate to the greatness of their task, backed by the financial assistance of those who have the foresight to appreciate the accomplishment which is possible.

Trend of Canadian Chemical Trade

The diagram shows graphically the trend of the imports of chemicals and allied products into Canada during the past twenty-one fiscal years, and also the values of similar commodities of Canadian production exported during the same periods. In order that a more careful examination of these data may be made, tables also have been prepared in which the actual values have been tabulated in detail. One of these shows the values of each commodity imported under the group heading "Chemicals and Allied Products" during the fiscal year ending March, 1914, the last year before the war, and for comparison and observation of the present trend the values credited to the same items during each of the past four fiscal years. If information is desired as to the countries of import, quantities, tariffs, &c., reference may be made to the annual trade reports of the Bureau of Statistics. It seems hardly necessary to point out that this is a most significant compilation from the standpoint of the development of new chemical industries in Canada, since it sets forth in readily accessible form the essential information required by anyone desirous of opening up a new line of chemical manufacture in Canada.

The trend of Canadian production for export trade is shown in another table in which the values of Canadian-made chemicals and allied products exported during the fiscal year 1914, and the past four fiscal years, are given by items. The continuous advance which represented normal conditions before the war was much accentuated in the last four war years, and it is encouraging to note that during the past two fiscal years the export trade has been maintained at a level very considerably above what the normal pre-war rate of increase would have produced. That the lead obtained is being thus held furnishes ground for the hope that the ratio of exports to imports in these commodities may be yet further increased.

British Sulphate of Ammonia Federation

Chairman's Speech on Position and Prospects

At the first annual general meeting of the British Sulphate of Ammonia Federation the CHAIRMAN (Mr. D. Milne Watson), in reviewing the work of the year, said that the Federation included nearly 400 manufacturing members and associates by agreement. It represented the idea of co-operation among producers to secure the highest standard of production and the widest possible distribution of their product. It had been able to resist the waves of American, Chilean, and German competition, and, by maintaining an unbroken front, to preserve the interests—he might almost say the existence—of British sulphate of ammonia makers. The producer wanted a steady remunerative price, not violent fluctuations. A steady price could only be maintained if the producer had an effective voice in controlling sales and the destination of his product. The only remedy for present industrial difficulties was for manufacturers to combine together in order to improve their methods of production, to study the needs of the consumer at home and abroad, and to widen their markets. Organisation and efficiency provided a better way than the erection of tariff walls or any other form of State interference.

The Problem of Prices

Dealing with the problem of prices, the Chairman expressed the opinion that with the great development of productive capacity, which was bound to take place when peace had been restored in the world, it would be impossible for any combination of manufacturers to maintain prices at levels which left inordinate profits on cost of production.

"We have had two striking examples," he said, "during the past year of the Nemesis which overtakes a policy of extravagantly high prices. The Chilean Nitrate Producers, sitting in conclave 10,000 miles from their chief consuming markets, fixed a scale of prices in the summer of 1920 which was far above the capacity of consumers to pay. They sold a vast quantity at these high prices to a number of unfortunate merchants and speculators who were ignorant about the possibilities of consumption. I cannot help feeling that, if the Chilean producers had been in closer touch with actual consumers, the crisis which has caused fluctuations of over 50 per cent. in the price of nitrogen and has imperilled the very existence of the Chilean State would never have occurred, because the attempt to force up prices would never have been made.

"We have another example in what is happening in regard to sulphuric acid. We greatly sympathise with acid makers—some of whom are members of this Federation—in their difficulties. We know that they have had to pay high wages, high costs of renewal, and high prices for their raw material. Nevertheless, an attempt has been made to hold up prices at a level which consumers could not afford to pay. That attempt has failed, and I think acid makers are beginning to realise that, just as the chemical industry of this country was unable to bear the price of £5 to £6 per ton last year, so now industry cannot get on to its feet again with acid at anything like £4 to £5 per ton. We believe that acid could be sold to-day at 60s. per ton without loss, and we must look to secure far more drastic reductions in the near future."

Steps to Improve Organisation

"The report indicates two directions in which it may be possible to move in order to secure that object. There need be no fear of loss of individual effort or incentive because we are members of a combine. Quite the contrary. In our own case there is a very healthy spirit of rivalry among the individual producers to improve the quality of their output. We can claim that, since the formation of a really effective central body for marketing the output of sulphate of ammonia here five years ago, greater progress has been made in the improvement of quality than during the preceding twenty-five years and more. That I believe to be due chiefly to the fact that we have brought home directly to the producer the needs of the consumer, and have given the maker first-hand information about the doings of our competitors.

"We have further endeavoured to strengthen our position generally by our attempts to arrive at an understanding with our chief overseas competitors. The report shows clearly that we are under no extravagant illusions as to the immediate results to be expected from these attempts. We must continue to rely primarily on our own powers of meeting competition and on our own propaganda work in order to secure our position. Nevertheless, it is right that an attempt should be made to understand the point of view of our competitors, both producers of sulphate of ammonia and other forms of nitrogen, and to see whether a measure of agreement cannot be attained which will, at any rate, help to increase the consumption of nitrogen as a whole, prevent speculation by middlemen whose only object is to make a profit on the immediate deal, and to avoid those violent fluctuations in price which benefit nobody except speculators in the long run. These conferences have at least made it plain to the other groups that a fundamental change has taken place in the organisation of British producers, and that producers of a by-product are in a strong position if it comes to a fight."

Nitrogen for Agriculture

"I think it is clear that the capacity for producing nitrogen in the world to-day is far in excess of the possibilities of immediate consumption. But I am sufficiently optimistic to believe that in the future the world will require all the nitrogen which can be produced in order to support an ever-increasing population and provide a higher standard of life. We must seek out the individual farmer and prove to him that it pays him to use nitrogen, and to use it in far larger quantities than he has dreamt of before. To do this we must show him that success can be achieved on a large scale and under conditions exactly similar to those under which he is working. That is why we attach so much importance to the arrangement which we have made with the National Institute of Agricultural Botany. We are going to try and make the farm at St. Ives (and the other farms which we hope to work in the same way later) the envy of farmers near-by and far away, so that they are stimulated to go and do likewise. I believe that envy will prove a more potent spur than Government exhortations, regulations, and leaflets.

"There are many who think the Government have made a grave mistake in repealing the Corn Production Act; there are others who feel that the giving of doles, in any circumstances and in any form, is wrong. But I think it is permissible to point to a possible *via media* between these extremes. Our farmers have been very badly hit by the recent fall in all agricultural produce. Many of them bought their farms at excessively high prices during the war and after, and in consequence are now in financial difficulties. They must perforce economise, and many of them say openly that they intend to economise by doing without fertilisers. That is false and disastrous economy, but you cannot force a man with no means to buy. What you can do is to deliver the fertilisers to him in return for part payment of the price, and let him pay the balance when he has sold his crop. With costs of production running as high as they are to-day, and with selling prices down to something like pre-war level, we manufacturers have no margin out of which to give credit to farmers. We feel that we have already made a very substantial contribution towards helping the farmer by reducing our prices so drastically. We wish to take some credit for the fact that we were the first among fertiliser producers to make a really substantial reduction in price. At our scale of prices for June to December, ranging from £13 3s. to £14 10s. delivered to British farmers, sulphate of ammonia has been by far the cheapest form of nitrogen available. But low prices are not much consolation to the man without cash. If, after proper investigation, it is found that farmers generally are really as hard hit as they lead us to believe, I suggest that the Government might find it in the national interest to enable British fertiliser makers to give credit to the farmer at home in exactly the same way as the Government is helping exporters.

Future Prices

"As to future prices, while we cannot, ought not to look for a return to anything like the level of price which we obtained last year, we see no reason at present why we should not be able to maintain our present position. Our general position is vastly improved compared with what it was at the end of May, for our drastic reductions in price have enabled us to liquidate the whole of our stocks; at the same time we have orders on our books for a substantial portion

of our future production. In conclusion, I feel that the Federation has fulfilled the hopes and expectations of its founders during a year of exceptional difficulty, and we can face whatever the future has in store for us calmly and stedfastly, if we can continue to count on your support and that of all our other members." (Cheers.)

The report and accounts having been adopted, on the motion of SIR ARTHUR PEASE, seconded by ALDERMAN W. KAY (ex-Lord Mayor of Manchester), both of whom spoke in complimentary terms of the work of the chairman and executive committee, Mr. D. Milne Watson was re-elected chairman. Mr. E. J. George (Consett Iron Company, Ltd.) and Mr. A. K. McCosh (William Baird & Co., Ltd.) were unanimously re-elected vice-chairmen. A hearty vote of thanks was accorded to the chairman, vice-chairmen, executive committee, and the staff for the services rendered to the Federation during the year.

Germany Seven Years After

By C. H. Hughland

IV.

PLATO, Sir Thomas More, Bellamy, William Morris, H. G. Wells, and Socialists of various kinds have conceived of Utopia—the Perfect State. Once or twice in recent history everything which stood in the way of its realisation has been violently removed and the world has waited expectantly for the fulfilment of the dreams of its idealists. A new start by new people was made when the mob beheaded the kings and nobles of France. Similar happenings took place more recently in Russia. The Czar and his archdukes of ten years ago would have pooh-poohed the idea of a horde of moujiks dispossessing them, but they have vanished from Petrograd, nevertheless.

Germany also has had her revolution, though the form it took was not so violent as that which affected her Eastern and Western neighbours. The Kaiser and his sons, his colonels and his captains, have departed. To-day the Socialists hold the reins of power, and the visitor to Berlin wonders what differences he will find under the new *régime*. Has the coming of the Utopia Germanica changed the appearance of the Tier Garten, the Friederickstrasse, and the Schlossplatz? Will the visitor find a prosperous, contented people enjoying the new-found advantages of liberty, equality, and fraternity? If he remembers the Berlin of ten years ago he will be enormously struck by the difference in it to-day. The spirit appears to have gone out of it, and official personages apologise rather abjectly for the disorder and slovenliness which now characterises what was once one of the smartest and cleanest of the show places of Europe.

Though there are many other changes, the outstanding difference is the absence of soldiers. The sentry-box at the Brandenburger Thor is empty; uniforms have vanished from the streets, cafés, hotels, and the Opera House; the rather fussy police, with their shiny helmets, have been replaced by soberly-dressed and rather demure-looking youths in uniforms not unlike those of mechanics in the Royal Air Force. The ex-Kaiser's palace, the exterior of which was never very beautiful, now looks dirty and ill-kept and the galleries are being used as a museum for old furniture. The state apartments are shown to the public for a small fee. They are theatrically over-decorated and, to the Englishman, with his restraint and love of good taste, incredibly vulgar in appearance. The square in front of the palace, formerly a well-kept garden in which a military band used to play every morning, is now untidy and deserted. At present extensions are being made in the underground railway system, and many of the principal thoroughfares are littered with the coarse sand on which the city is built. The authority responsible for the sweeping of the streets is, for some reason, not doing its work efficiently, for, in addition to the sand, paper, fallen leaves, and the miscellaneous dirt and *débris* of a large centre of population are to be seen everywhere. The motor-'bus has not been developed and taxis are in a considerable minority as compared with horse-drawn vehicles. To those conversant with London and Paris these curious, little, open vehicles drawn by shambling Russian ponies, give to the streets of Berlin much of the appearance of a rather backward provincial town.

We have been encouraged to believe that under Socialism strikers would cease from striking, and the weary workers be at rest, but that is not quite how it worked out in Berlin a month ago, for the waiters, most efficient and obsequious of men, were out. Inside the restaurants the customers waited, in a very literal sense, for their food, while outside the doors Karl and Fritz and Heinrich were acting as pickets, carrying placards in which their view of the dispute was stated, with characteristic thoroughness, in English, French, and German.

The people for the most part accommodate themselves to the new conditions, though many—more particularly the official classes and the Royal Warrant Holders—bitterly regret the passing of the former glories of the Court. More than one influential German whom I questioned as to the attitude of the people towards the present Government said, "It exists only to squeeze money out of us." The street hawkers still sell photos of the ex-Kaiser, not in his brilliant trappings as All-Highest War Lord, and not, as might be supposed, in the wide trousers beloved of the Dutch peasantry, but clothed as a simple civilian in mufti.

I gathered that many Germans, no longer in fear of proceedings for *lèse-majesté*, are not a little disgusted with the lack of spirit shown by the ex-Kaiser when he saw that all was lost. Had he taken a cup of poison like Socrates, committed *hari-kari* like the Samurai, fallen a victim to the blows or bullets of the revolutionaries, he would to this day have been a national hero, and a monarchist *coup* in Germany might be a source of real danger. But instead of some magnificent final gesture to show how well a kingly man might die, there was secret flight to a neutral country, wood cutting, and mere oblivion. At the moment his place is filled by a man who was once a working saddler. This, too, is keenly resented, for many Germans who have no desire for a return of the Hohenzollerns would like to be represented by a man of education and social standing.

The slovenliness which characterises Berlin is not difficult to understand. For half a century everything has been "Verboten." The people were drilled and dragooned, spoon-fed with ideas, told exactly what to think and where to put their feet, and suddenly the power which regulated their lives vanished into thin air, and they were left to do things in the way that seemed good to themselves. Reaction was inevitable, the whole fabric, bereft of its energising principle, weakened and slackened, and the people are now waiting—as the great mass of people wait the world over—for a man with a purpose to lead and govern them.

There are no slums in Berlin, and no barefooted children in the working-class quarter of the city, but the Socialists cannot take credit for that, since for the last twenty years there never have been any slums worth mentioning in the German capital. On the pavements in the principal thoroughfares sit mutilated men, pathetic creatures, doomed to shake and tremble till they die—the broken remnants of an army that in the hey-day of its power regarded them as cannon fodder. But Berlin has wounds other than these to show. In spite of all that has been said to the contrary, the people know that Germany is a beaten nation. The Socialists may one day rename the city, calling it Utopia, but that day is not yet.

West Yorkshire Metallurgical Society

As the result of a meeting held on November 26 at the George Hotel, Huddersfield, it has been decided to form a society to be known as the West Yorkshire Metallurgical Society. One of the objects of this society is the interchange of ideas by means of (*a*) the reading and discussion of papers and lectures dealing with the study and practice of metallurgy and its branches; (*b*) the visiting of works in the locality where metals are manufactured, refined, or worked, and works whose industry is allied to that of metallurgy. Membership is confined to (*a*) persons holding responsible positions in works where metals are manufactured, refined, or worked; (*b*) persons over eighteen years of age who are pupils or assistants to persons as above, whether such persons are members of the society or not; (*c*) persons not otherwise qualified, but who possess an interest in metallurgy, and who, in the opinion of the committee, possess technical or scientific attainments. Mr. T. E. Hull was unanimously elected as president; Mr. A. Hudson, hon. treasurer; Mr. H. C. Dews, 17, St. John's Road, Huddersfield, hon. secretary; and Messrs. G. France, J. Handforth, S. Gamble, F. Rawlinson, A. Jackson, F. Kilburn, R. Pitt, and W. Pool, committee.

Plantation Rubber

Standardisation and Rate of Cure

At the second London meeting of the Institution of Rubber Industry, held at the Royal Society of Arts, John Street, Adelphi, Sir Frank Swettenham presiding, Dr. H. P. Stevens read a paper on "Plantation Rubber: Effect of Different Methods of Preparation on its Behaviour in the Factory," in which he said that in the discussion which followed the reading of his paper at the first Manchester meeting several gentlemen advocated standardisation of procedure, and he was able to show that standardisation had occupied the attention of rubber planters almost from the inception of the industry, and that, as a result of recommendations made by a special committee of the Rubber Growers' Association, definite instructions were issued for the guidance of planters. It was for the manufacturers to show their appreciation of standardisation by purchasing rubber from estates which adopted these measures.

On the other hand, it must be remembered that only about half the total output of rubber was capable of any considerable degree of standardisation. In the first place, said Dr. Stevens, a great part of the rubber was produced by native holders, and nothing but legislative action could enforce correct methods of treatment. Thus, the use of alum for coagulation had recently been prohibited. Without legislation there was no check on the treatment of the latex, and it seemed quite obvious to the lecturer that no satisfactory procedure could be enforced without personal supervision over each native while he prepared his rubber.

Much of this rubber found its way to centres such as Singapore, where it was washed, creped, packed, and exported. It was obviously useless for manufacturers to ask for such rubber to be standardised, and the amount produced must be considerable. On the plantations themselves, perhaps from 25 to 30 per cent. of the rubber was obtained in the form of scrap, which could only be partially standardised, although estates did their best to turn out thin brown crepes clean and uniform. It was only with liquid latex that standardisation could be satisfactorily carried out. This was done on the majority of the larger estates by bulking the latex dilution to a standard rubber content and the addition of the calculated proportion of acetic acid, which itself had been previously diluted to a standard.

Averaging Rubber

When rubber was required for the manufacture of high-grade articles, the manufacturer should use latex rubber, and even then, to avoid pitfalls, he must take certain precautions, the most obvious of which was to average his rubber by taking pieces from a number of cases for each batch. Dr. Stevens said he thought that the averaging might be extended to both the masticating and mixing operations. Thus rubber for a number of cases would go to make up the batch for masticating, and portions from different masticated batches could be taken for making up the rubber for the batch of mixing. In this connexion the lecturer suggested that manufacturers of rubber machinery might be able to devise a machine for averaging large quantities of plantation rubber. There were some very progressive machinery makers in this country, and he hoped they would give this suggestion their earnest consideration.

Causes of Variation

There was bound to be some variation with latex rubber in spite of standardisation, and in support of this contention Dr. Stevens enumerated some of the causes which lead to varieties in the rate of cure and which were beyond control. On the other hand, there were some factors tending to render the rubber more uniform. The storage of raw rubber under suitable conditions tended to level up the rate of cure, *i.e.*, fast vulcanising, rubber tended to vulcanise slower and slow to vulcanising faster. Various difficulties were met with during the war and for some time afterwards due to a shortage of acetic acid for coagulation. This led to the use of substitutes and acid of inferior quality.

Discussion

Sir Frank Swettenham asked if there was any difference between latex from a tree six years old and that taken from a tree twenty years old. He had noticed during the last fifteen years or so that people who had used wild rubber before turning to plantation rubber still stuck to their old love. Perhaps this was because the wild rubber never varied.

Mr. Brooking said there was a sort of subdued feeling between manufacturers and planters, and he hoped that the Institution would be able to remove that feeling. The misunderstanding on the manufacturers' side was that they should receive a uniform raw material, and they felt that the growers had not helped them in this matter as clearly as they might. As a number of manufacturers dealt with a rubber content of from 40 per cent. downwards he did not think there was much chance of variability affecting the goods. The cleanliness of the rubber was an important point.

Mr. Rogers said he could not think that any scheme of mixing various rubbers in the factory would be successful. The grading of rubbers was very difficult, and he felt that the difficulty should be solved by the planters.

Mr. Tracker said that although certain plantations marked their cases with a distinctive mark, it did not follow that the rubber inside was their own. It was quite easy for the original rubber to be substituted by an inferior grade.

Mr. Cohen, speaking as a planter, said they did their best to turn out good rubber, and he had never heard a real complaint from a manufacturer. On his estate they packed the rubber in cedar or mahogany cases—these were the only woods available—and the rubber was perfectly clean.

Mr. Howie was of the opinion that a lot of trouble on both sides was due to moisture in the atmosphere. Grading was impossible unless one could ensure that the rubber would reach the factory without absorbing moisture in transit. He explained the Hunter process, which, he claimed, produced a uniform article and added to the tensile strength of the rubber. He suggested that this process might furnish a solution to many of their difficulties. He also thought that rubber should invariably be bought for its tensile strength, and not for its colour or smell.

Dr. Schidrowitz said he was amazed at the importance attributed to the question of variability; in regard to 70 or 80 per cent. of the rubber produced, it did not now arise at all. He was of the opinion that standardisation on the estates had been enormously improved of late, and the vast bulk of plantation rubber was now extremely reliable and non-variable. When manufacturers spoke of variability it was not altogether clear whether they referred to rate of cure only. In respect of about 70 per cent. of all plantation rubber there was very little difficulty regarding the rate of cure. Last year 300,000 tons of plantation rubber were produced as against 20,000 tons of Para, and these figures, he thought, spoke for themselves.

Dr. Stevens's Reply

In his reply Dr. Stevens said that as a result of many experiments the general conclusion was that it made no difference whether a tree was six or twenty years old. Trees only produced abnormal latex for a short period after tapping. There was no means of distinguishing scrap from first latex crepe. The manufacturer was safer with latex rubber than with scrap. The amount of bisulphide of soda in plantation rubber was infinitesimally small, and was not more than one part in 800 parts of latex. This was only used to retain the colour of the rubber. It had no bleaching properties. Rubber stored for two or three years was not necessarily as good as new; small changes took place, but they were not important. With reference to drying, plant had been abandoned in favour of air drying or smoking, and he did not appreciate that drying by the Hunter process would make for uniformity. He was in entire agreement with Dr. Schidrowitz's remarks, and he (Dr. Stevens), when at Manchester, had asked manufacturers to say what they meant by variation, but he received no replies. Great care was needed in the use of accelerators, but, if used properly, they should have a great future in the industry.

Sir Frank Swettenham, referring to Mr. Brooking's complaint about the dirty condition of the rubber, said there was nothing impressed upon the plantation staffs more than the necessity for cleanliness. He suggested, in order to stop the ceaseless warfare between the people on the estates and the buyers of rubber, that Mr. Brooking should get an experienced rubber manufacturer to go out to the Federated Malay States, see how the plantations were conducted, and make any suggestions he thought fit.

Mr. Brooking said Sir Frank Swettenham's suggestion was a most useful one, and would be duly considered by the Council of the Institution of Rubber Industry.

Safeguarding of Industries Act

First Committee under Part II. of the Act

THE Board of Trade give notice that in exercise of the powers conferred upon them by Part II. of the Safeguarding of Industries Act, 1921, they have referred to a Committee constituted for the purposes of that Part of the Act, and consisting of: Sir William Ashley, Ph.D. (Chairman), Mr. J. Arthur Aiton, C.B.E., Sir Thomas W. Allen, Sir John N. Barran, Bart., and Mr. F. R. Davenport, to investigate a complaint by the British Flint Glass Manufacturers' Association and the National Flint Glassmakers' Society. The complaint is that articles of domestic glassware, illuminating glassware, and mounting glassware, manufactured in Germany and Czecho-Slovakia, are being sold, or offered for sale, in the United Kingdom at prices which by reason of depreciation in the value in relation to sterling of the currency of the above-named foreign countries are below the prices at which similar goods can be profitably manufactured in the United Kingdom, and that by reason thereof employment in the glass industry in the United Kingdom is being or is likely to be seriously affected.

The Committee are directed after ascertaining the facts to report to the President of the Board of Trade (*a*) Whether the conditions specified in Section 2, Subsection (1) of the Safeguarding of Industries Act, 1921, are fulfilled; (*b*) on the effect which the imposition of a duty under Part II. of the Act on goods of the class or description covered by the complaint would exert on employment in any other industry being an industry using goods of that class or description as material; and (*c*) whether in the opinion of the Committee production in the industry manufacturing similar goods in the United Kingdom is being carried on with reasonable efficiency and economy.

The Committee who held a preliminary meeting on Tuesday propose to hold their first sitting for the taking of evidence at 2.30 p.m. on Monday, December 12, at the Hotel Windsor, Victoria Street, London, S.W. 1. The Secretary to the Committee is Mr. W. G. Fergusson, Board of Trade, Great George Street, London, S.W. 1, to whom all communications should be addressed.

Institute of Chemistry

Huddersfield Section

THE first annual general meeting of the Huddersfield Section of the Institute of Chemistry was held on Friday, November 25, in the Queen Hotel, Huddersfield. Dr. H. H. Hodgson took the chair. Letters from several members regretting their inability to attend were acknowledged. The Chairman announced that the committee had met, and, in accordance with the rules, elected the chairman and treasurer, so that the officers and committee were as follows:

Chairman.—Dr. H. H. Hodgson.
Treasurer.—Dr. S. Robson.
Secretary.—Mr. D. H. Peacock.
Committee.—Dr. A. E. Everest, Mr. H. W. Moss, Dr. E. F. Pollock, and Mr. J. H. Wilson.

The Chairman briefly outlined the policy which the committee hoped to pursue. Within the section they hoped to promote good fellowship and a keener sympathy based on common interests. With regard to their relationship as chemists to the State of which they were citizens, he called their attention to a recent address by Sir Richard Gregory, and emphasised a point there raised that in the past scientists had been too centralised, and the nation, although its prosperity had increased largely as a result of their research, had been unaware of their existence. The formation of the local section was an attempt to decentralise without, however, becoming parochial in interest. It was hoped to hold meetings, addressed by specialists and well-known speakers, which would help the members of the section to keep alive their interests in the matters not directly affecting their special work, and would also educate public opinion in the district in matters chemical.

Mr. G. S. W. Marlow, assistant secretary of the Institute, then addressed the meeting. He advised the section to endeavour to give the widest publicity to its proceedings in the local press, and so help to mould public opinion. He stated that the council hoped that the various Yorkshire sections would co-operate as far as possible in the way of joint meetings. The section could be of considerable use to the council in advising it as to the qualifications of intending members, and also in persuading men to join who, although eminent chemists, were outside the ranks of the Institute. Help could also be given to the Council in the matter of the admission of students and in regard to the general policy of the Institute. During the subsequent discussion of the rules Mr. Marlow contributed much valuable advice.

It was announced that in January and March joint meetings with the Yorkshire branch of the Society of Chemical Industry were to be held in Huddersfield, which would be addressed by well-known chemists. The time and place of these meetings would be fixed later. The February meeting of the section would be confined to members only, and would take the form of a discussion on the relation between the Institute and Technical Education in this country. The proceedings terminated with an informal smoking concert, to which Mr. W. E. Sanderson and others contributed.

Pharmacy Acts Amendment Bill

Attitude of the Institute of Chemistry

BY direction of the Council of the Institute of Chemistry Mr. R. B. Pilcher, the registrar, has addressed to the three members of Parliament responsible for the above Bill a letter in which he says:

"The attention of the Council of the Institute of Chemistry of Great Britain and Ireland has been directed to 'a Bill to regularise the position of all persons trading as chemists and druggists or pharmacy store proprietors in the sale of drugs, the dispensing of doctors' prescriptions, and the sale of medicine.' The official print states that the Bill was presented by Captain O'Grady, and supported by Colonel Watts Morgan and Mr. Casey. In this Bill reference is made to 'the Incorporated Society of the Institute of Chemistry' and to 'the Institute of Chemistry.' The Institute of Chemistry of Great Britain and Ireland is the only body in this country incorporated by Royal Charter whose title contains the words 'Institute of Chemistry,' and the Council of the Institute desire me to inform you that they have not been consulted with regard to the provisions of this Bill and have not had any information regarding its promotion.

"The Institute of Chemistry is established to examine and register persons found competent to practise chemistry in its applications to the arts and manufactures, as distinct from those who practise pharmacy and are engaged in the sale of drugs and medicines, and in the dispensing of prescriptions. The Council of the Institute deplore the confusion which arises through the application of the term 'chemist' to two distinct callings, and they would welcome any legislation which would tend to remove this confusion. They hold that the use of the distinctive titles of 'chemist' and 'pharmacist' to denote these callings would tend to the general recognition of the difference between them and to the removal of a confusion which exists in no other country. The Council wish to dissociate themselves from the suggestion that they should be represented on the Central Council, which it is proposed in the Bill shall be concerned with the Pharmaceutical Register, and from taking any part in the examination and registration functions vested by Royal Charter and the Pharmacy Acts in the Pharmaceutical Society of Great Britain. The Council do not feel called upon at present to comment upon the other provisions of the Bill."

Criticism of Key Industries Act

THE British Laboratory Ware Association has sent the following resolution to the Board of Trade protesting as strongly as possible against the framing and methods adopted in applying the Safeguarding of Industries Act, 1921:

"This Association only supported a Key Industries Bill on the understanding that an Act would be passed to work a schedule of articles vital to this country in peace or war, the schedule to be drafted and revised from time to time by an executive committee of manufacturers, dealers, and users. The schedule of the present Act appears to have been drafted in such a way as to include everything that could be thought of that borders, even remotely, on the requirements of science, whether procurable in this country or not. The Act and schedule as they stand contain provisions which will not help the vital key industries of this country, and will tend to create unemployment, and are seriously interfering with export trade."

Meetings of Nitrate Companies

A More Favourable Outlook

SPEAKING at the thirty-eighth annual meeting of the Liverpool Nitrate Co., Ltd., at Liverpool, on November 24, Sir Robert Harvey, after explaining the cause of the state of the nitrate industry during the past twelve months, said that the recent agreement between the Pool and the Association would enable the former to diminish some of their loss, which, however, would be many times greater than the amount of compensation to be paid to them. The cultivated soil in all countries stood more in need of replenishment by nitrogenous fertilisers than it did even a year ago; but the consumption of nitrate depended upon the sagacity of the farmer and his ability to pay for it, notwithstanding that the nitrate was now obtainable at a reasonable price. The oficinas of the Liverpool Nitrate Company, as a consequence of the unsatisfactory state of affairs to which he had been referring, were closed. Their unsold stocks were more than sufficient to satisfy all sale allotments they might be called upon to fulfil during the current financial year, unless there were a considerable improvement in the consumption in the coming season. In the past the nitrate industry had had many periods of prosperity and depression, and if they saw a sudden revival it would not be the first time it had occurred. Five months had already elapsed of the current year, and their business remained at a standstill. Although the immediate future might not be very promising their general future was assured, and the quality of their grounds and machinery ensured their prosperity for a long series of years.

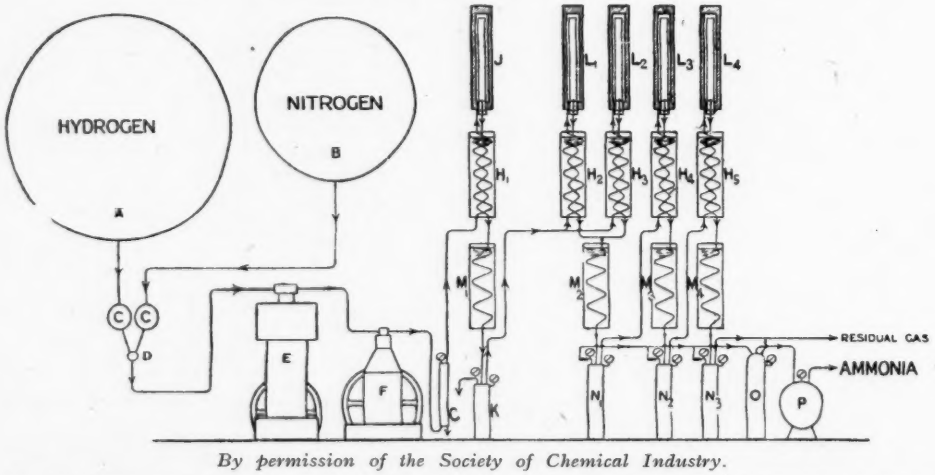
London Nitrate Company

Mr. Frank Tobin, in the course of his speech at the annual meeting of the London Nitrate Co., Ltd., held at Liverpool, on November 24, said no industry in the world was subject to quicker changes from prosperity to adversity than the nitrate industry, and they in all their experience had never known a period such as the past twelve months. It appeared worse because it succeeded a period of great prosperity. Their own balance-sheet showed a trading profit of over £100,000, which was the biggest thing the company had ever done, and that sum was actually made in less than six months. The year's profit had been very much cut into, however. The Santa Laura oficina, of which they had had such high hopes, had now conclusively proved to be a super-producer of nitrate, and for many years he anticipated that its output would be produced at a cheaper rate than that of any other.

Santiago Nitrate Company

Mr. Edward Eyre, speaking on Monday at the twenty-second annual meeting of the Santiago Nitrate Co., Ltd., held at 10, Lime Street, London, said they were not satisfied with the quotas the company had been offered as regarded their output of either nitrate or iodine, but they had no doubt that both these matters could be adjusted satisfactorily. The nitrate industry was passing through a critical period, but this company was in an exceedingly healthy position financially, thanks to the fact that the industry was controlled by its Association of Producers. Notwithstanding the huge losses incurred by those firms who had purchased from the Association at exceedingly high prices, not only had they lived strictly up to the terms of their purchase contracts, but they had not even asked for any extension of time or accommodation of any kind in meeting their obligations. The company were very glad to have got those exceedingly remunerative prices, especially considering the very low price at which nitrate had to be moved immediately after the Armistice. Having referred to the arrangement recently made by the Association with their buyers, he said that the industry had not been unmindful of the Chilean Government's difficulties arising from the suspension of shipments pending the realising of the Pool's stocks, and would only wish to be in a position to alleviate them; but that was beyond its power, and was a matter of time and patience. Some of the producers considered that their millennium would come when the sale of nitrate was centralised, or when it was shipped on consignment. No doubt some arguments could be advanced to favour centralisation, but they were outweighed by a multitude of reasons *per contra*. What the industry must do was to intensify propaganda, beginning in those countries where prompt results were most promising.

The Claude Synthetic Ammonia Plant



By permission of the Society of Chemical Industry.

DIAGRAMMATIC ARRANGEMENT ILLUSTRATING MR. J. H. WEST'S PAPER READ BEFORE THE CHEMICAL ENGINEERING GROUP AND THE INSTITUTION OF MECHANICAL ENGINEERS.

This figure shows the general arrangement of the plant. A and B are the hydrogen and nitrogen gasholders respectively, with meters, C, on the delivery pipes. The gases are mixed at the valve, D, and pass to the compressor, E, where they are compressed to 100 atmospheres. After going through an oil and water separator (not shown) the mixed gas is compressed to 900 atmospheres in the "super-compressor," F. Another oil and water separator, G, follows, and then the gas goes, *viâ* a heat interchanger, H_1, to the protector tube, J. Any water formed from traces of carbon monoxide or oxygen present in the gas is condensed in the cooler, M_1, and separated in the small separator, K. The pure gases next pass through the heat interchangers, H_2 and H_3, and the first two catalyst tubes, L_1 and L_2, in parallel, returning through the heat interchangers and the cooler, M_2, to the separator, N_1, where the liquid ammonia formed is withdrawn. The uncombined gas then continues through heat interchanger, H_4, to the third catalyst tube, L_3, back through cooler, M_3 to separator, N_2, and the gas still uncombined goes to the last catalyst tube, L_4, and back to separator, N_3, as before. The ammonia from the separators is blown into the collecting bottle, O, and from there to the storage cylinder, P.

Chemical Traders' Affairs

Benzoates Limited

The following are among the creditors in the liquidation of Benzoates, Ltd., 113, High Street, Watford, Herts: A. Bishop, Ltd., London, £114; Menley & James, Ltd., London, £50; H. N. Morris & Co., Ltd., Manchester, £2,270; V. C. North, London, £1,500; and V. C. North & Co., London, £82.

Nagels and Co.

A sitting for public examination under the receiving order made against Nagels & Co., chemical merchants, 51, Fenchurch Street, London, E.C., was held on Tuesday at the London Bankruptcy Court (*see* THE CHEMICAL AGE, Vol. V., pp. 280 and 343). The proceedings were on the petition of John Elton & Co., Ltd. Mr. F. T. Garton, Official Receiver, reported that the debtor, who had traded under the style of Nagels & Co., had not surrendered to the proceedings, and was believed to have gone to Antwerp. The registrar adjourned the examination *sine die*.

E. F. Bush

The schedule of creditors in the liquidation of Emil Frederick Bush, 120, High Road, New Southgate, Middlesex, colour and chemical merchant, includes: British Alizarine Co., Ltd., London, £222; British Cellulose and Chemical Manufacturing Co., Ltd., Derby, £21; British Ultramarine Co., Ltd., Stratford, £10; Cornbrook Chemical Co., Ltd., Stockport, £27; Gutter Hill Colour & Chemical Co., Ltd., Manchester, £11; Golden Valley Ochre & Oxide Co., Bristol, £98; J. Hare & Co., Bristol, £112; W. H. Holmes & Sons, Newcastle, £68; B. Laporte, Ltd., Luton, £47; Rawlins & Son (Ultramarine), Ltd., Rainhill, Lancs, £49; Saville Marvel & Co., Ltd., Manchester, £226; Strathclyde Paint Co., Glasgow, £217; W. Symonds, London, £101; and A. Connell & Co., London, £7.

Massey and Winbury

A sitting was held at the London Bankruptcy Court last week for the public examination of Mr. Raymond Massey and Mr. Max Winbury, lately trading as Massey & Winbury, merchants, 17, Queen Victoria Street, London, E.C., who had lodged a statement of affairs showing liabilities £2,589 and assets *nil*. It appeared that in June, 1919, the debtors entered into partnership and traded as importers and exporters of general merchandise. The business was successful, and, to obtain further capital, they, in September, 1920, transferred it to a company called Massey & Winbury, Ltd., of which they became joint managing directors. The company went into voluntary liquidation in March last (*see* THE CHEMICAL AGE, Vol. IV., p. 423). Before the company was formed they entered into several contracts for the purchase of acetic acid, but subsequently they declined to take delivery, and judgment was obtained against them for damages for breach of contract, and bankruptcy proceedings followed. The examination was concluded.

A. Van den Hurk

Adrianus Henrikus Van den Hurk, produce merchant, late of 35, Crutched Friars, London, E.C., who failed in March last, applied at the London Bankruptcy Court recently for an order of discharge. Mr. Frank Daphne opposed the application on behalf of creditors; and Mr. Tindale Davis appeared for the debtor. Mr. Walter Boyle, Official Receiver, reported that the debtor had estimated his ranking liabilities at £36,565, but the proofs of debt and probable claims amounted to £110,433. This large difference was due mainly to the fact that the liquidator of A. Van den Hurk, Ltd., had proved for £66,477, whereas the debtor only admitted liability for £5,000. The position was not at all clear, and probably some debts had been proved twice. As far as he could ascertain, at least £26,000 would have to be deducted from the liabilities on that ground. In opposition to the discharge the Official Receiver submitted (1) that the assets were less than 10s. in the £; (2) that the debtor had contributed to his bankruptcy by rash and hazardous speculations; and (3) that he made a settlement on his wife, which was unjustifiable having regard to the state of his affairs at the time. Mr. Daphne sought to establish a further charge on behalf of a Mincing Lane firm of rubber merchants namely, that the debtor falsely and fraudulently represented that he was entering into certain transactions with this firm on behalf of the limited company, whereas the transactions were on his own behalf. Mr. Registrar Mellor, giving judgment, said that he was not satisfied that there was any direct representation that the deal was to be on behalf of the company, and, therefore, the charge of fraud had not been proved. On the grounds reported by the Official Receiver, the discharge would be suspended for three years.

Steadman Brothers

The first meeting of creditors of Steadman Brothers, general merchants, Cubitt Town Wharf, Cubitt Town, E., and late of 1, Catherine Street, Hoxton, was held last week at the London Bankruptcy Court. It was stated that the firm consisted of Percy Valentine Steadman and his elder brother, A. H. Steadman. According to the statements of P. V. Steadman, the partnership was started at the end of 1918. No profits were made, and the premises were given up. About December, 1919, they made an arrangement with a firm of merchants to manufacture soap under which the firm in question were to supply all raw material and take half the profits. After running this business for three months the soap market collapsed, and the debtors commenced trading in chemicals. They were successful until September, 1920, when the demand ceased, and they were left with a large stock of chemicals which was eventually realised at a heavy loss. The debtors had also lost money under arbitration awards in respect of chemicals which were not up to standard. They paid out awards to the amount of £1,000, and recovered judgment against their own suppliers. The debtors estimated their liabilities at £5,000, and disclosed no tangible assets except a small quantity of low-grade soap on which there might be a lien. No proofs of debt were lodged, and the case remained in the hands of the Official Receiver for administration in bankruptcy.

Lambert Cohen

The first meeting of creditors under a receiving order made against Lambert Cohen, merchant, 79, Coleman Street, London, E.C. 2, was held on Tuesday at the London Bankruptcy Court. The debtor, in a preliminary examination, had stated that in April, 1919, he, in conjunction with another person, formed the Anglo-Continental Mercantile Corporation, Ltd., to carry on business as chemical and general merchants. The nominal capital of the company was £5,000 in £1 shares, of which he received 40 per cent. and his partner the balance. Neither of them put any cash into the company. The debtor was appointed a director of the company, and was to receive a salary of £800 a year, but in July last he resigned office. The company was still in legal existence, but had no offices and possessed no assets. The debtor roughly estimated his liabilities at £1,800, and the only assets were his shares in the company, which were of very doubtful value. He attributed his present position to bad trade. The case was left in the hands of the Official Receiver for administration in bankruptcy.

Magnesium in Synthetic Organic Chemistry

At a meeting of the Glasgow Section of the Society of Chemical Industry, held on Tuesday in the rooms of the Institution of Engineers and Shipbuilders, Glasgow, Mr. W. E. Moody presiding, a paper was read by Dr. H. Hepworth on "Some Recent Applications of Magnesium in Synthetic Organic Chemistry." Magnesium employed for organic synthesis in the form of compounds, such as magnesium-ethyl-iodide, is known as the Grignard reagent. Dr. Hepworth gave an historic survey of the use of this reagent, and showed how valuable it had been in promoting numerous and diverse chemical reactions, and in the preparation of many new organic compounds. These compounds were almost exclusively of theoretical interest, but they had served to extend the boundaries of the chemist's knowledge, not only of carbon compounds, but also of the compounds of carbon with other elements, and of the chemistry of these elements in addition. The work upon this subject, begun in 1901, had become international, and British chemists had taken their full share in the enterprise. There was yet, however, much work to be done before this fertile field was exhausted. In conclusion, Dr. Hepworth summarised the methods of applying the Grignard reagent and reviewed the theories of its action.

From Week to Week

LIEUT.-COLONEL THE HON. MAURICE BRETT has been elected to a seat on the board of the Anglo-Burma Oil Co., Ltd.

A. E. WARDROP & Co., chemical merchants, of 13, Bath Street, Glasgow, have recently been elected members of the Glasgow Chamber of Commerce.

It is reported that a scheme for ADVERTISING BRITISH GLASSWARE the world over is at present under the consideration of the various trade organisations.

A paper on "Shibboleths of Science" was read by PROFESSOR T. S. PATTERSON at a meeting of the Andersonian Chemical Society held in Glasgow last week.

It is announced that MR. R. G. BARKER, of the British Dyestuffs Corporation, has been appointed scientific director of the British Launderers' Research Association.

Slight damage was caused by fire on Monday at the Charlton works of the UNITED GLASS BOTTLE MANUFACTURERS, LTD. The firm state that the output has not been interfered with.

CHAS PAGE & Co., LTD., 47-51, King William Street, London, E.C.4. announce that they are opening, on December 5, a branch office at 128, Ingram Street, Glasgow. The telephone number will be Bell 2266.

A meeting of the Chemical Society will be held on Thursday, December 8, at the Institution of Mechanical Engineers, Storey's Gate, Westminster, when PROFESSOR J. W. GREGORY will deliver a lecture on "The Genesis of Ores."

The values of United Kingdom IMPORTS FROM GERMANY during October show an increase of £23,730 over the figures for the preceding month. Imports of glass and glassware were £5,039 more, and scientific instruments £12,712 less than in September.

Speaking on Monday at the annual meeting of the SANTIAGO NITRATE CO., LTD., Mr. E. Edge, referring to the recent visit of Mr. Frame, a co-director, to Chile, said that it was quite possible that Mr. Frame would again be asked to visit the Coast on their behalf.

We regret to record the death on November 27 of MR. GEORGE HERBERT BRAMWELL, of E. Bramwell & Sons, Ltd., chemical manufacturers, of Navigation Chemical Works, St. Helens. Mr. Bramwell, who was sixty-five years old, was a member of an old St. Helens family.

In a case at the Mansion House, London, on Monday, in which it was alleged that manufactured pearls had been falsely described as Japanese culture pearls, MR. A. F. CALVERT, F.C.S., described tests he had carried out which supported the contention that they were manufactured products.

The Council of the Rubber Growers' Association, in a circular issued to PRODUCERS OF PLANTATION RUBBER, urge all producers who assented to the previous voluntary restriction scheme, which would otherwise terminate at December 31, to continue restriction during the first six months of 1922.

Notice is given that the latest date for receiving applications for the Government GRANT FOR SCIENTIFIC INVESTIGATIONS for 1922 is January 1 next. They must be made upon forms obtainable from the Clerk to the Government Grant Committee, Royal Society, Burlington House, London, W. 1.

In celebration of his recent marriage the employees of Messrs. J. B. Wilkinson, Dudley Hill Chemical Works, Bradford, last week presented MR. DONALD WILKINSON with a Jacobean oak clock and a dinner service. The presentation was made by Mr. H. Onn, one of the oldest of the firm's workmen.

In addition to the papers already announced, a paper on "The Chemistry of Polycyclic Structures in Relation to Their Homocyclic Unsaturated Isomerides. Part. II. Intra-annular Tantomerism," by E. H. Farmer, C. K. Ingold, and J. F. Thorpe, was read at a meeting of THE CHEMICAL SOCIETY, held at Burlington House, Piccadilly, London, on Thursday.

In a letter in the *Times* recently concerning the burial of Robert Boyle in a London church, Sir William Tilden suggests that "the time seems opportune for repairing some of the past neglect and for providing some kind of memorial to 'THE FATHER OF CHEMISTRY.' A simple tablet . . . would perhaps be sufficient and would cost a mere trifle."

The next meeting of the LONDON SECTION of the Society of Chemical Industry will be held in the rooms of the Chemical Society, Burlington House, Piccadilly, London, W. 1, on Monday, December 5, at 8 p.m., when the following papers will be read: "An Autoclave Test for the Grading of Chemical Glassware," by W. L. Baillie; and "Separation of Adherent Oil or Bitumen from Rock," by Dr. E. Fyleman.

The directors of the Anglo-Burma Oil Co., Ltd., announce that Mr. A. Beeby Thompson, of Messrs. A. Beeby Thompson & Partners, the company's consulting geologists for India and Burma, is *en route* for Burma for the purpose of making a detailed report upon the drilling programme to be adopted by the company, and to arrange the necessary staff. Negotiations have also been initiated on this side for the PURCHASE OF PLANT.

An experiment with PALM OIL AS MOTOR FUEL, with apparently successful results, is referred to in the report on the trade of Sierra Leone for 1920, just issued. Recent experiments on the Congo, the report states, open up a question of some significance to the palm oil industry. Palm oil is claimed to have been used very successfully as motor fuel on river steamers at a cost which compares favourably with other fuel.

The Anglo-Batavian Society has proposed an extension of the scheme for the INTERCHANGE OF LECTURERS between England and Holland, and has suggested a course of eight lectures from the British side this session. The Boards of Studies and the Committee of Medical Members of the Senate of the University of London have approved the scheme and have nominated Professor F. G. Donnan and Dr. J. F. Thorpe as lecturers in Chemistry.

At the INQUEST ON JAMES WRIGHT, a boilermaker in the employ of Lever Brothers, Ltd., who was killed on November 17 by an explosion which followed the application of an oxy-acetylene burner to a drum, it was stated that the drum had contained acetone, and it was suggested that in future all drums which had contained inflammable liquids should be washed out immediately on entering the works. A verdict of accidental death was returned.

Among the papers expected to be read at the meeting of the ROYAL SOCIETY on December 8 are "The Energy in Air, Steam, and Carbon Dioxide from 100°C. to 2,000°C. (W. D. Womersley; communicated by Sir Dugald Clerk); "Atmospheric Pressure and Refractive Indices with a Corresponding Table of Indices of Optical Glass" (Lieut.-Colonel J. W. Gifford; communicated by Sir J. Petavel); and "On the Viscosities of the Hydrogen Halides" (H. Harle; communicated by Professor H. L. Callendar).

We regret to record the death, on November 26, at Parklands, Oak Road, Higher Crumpsall, Manchester, of MR. JAMES ROBERT APPLEYARD, of the Royal Technical Institute, Salford. Mr. Appleyard, who was in his fifty-second year, was a Fellow of the Royal Society (Edinburgh), Fellow of the Chemical Society, and Fellow of the Institute of Chemistry. He had been a member of the Society of Chemical Industry since 1905. The interment took place at Weaste Cemetery, on Wednesday.

The third meeting of the MANCHESTER SECTION of the Society of Chemical Industry was held yesterday (Friday) at the Textile Institute, St. Mary's Parsonage, Manchester, when papers on "Heat Balance on Recovery Producer Plant with Gas Engines," by W. H. H. Norris, and "A Note on the Direct Titration of Alkaline Manganates," by Dr. J. J. Block, were read. The Committee have decided to cancel the arrangements made for the Annual Dinner on December 14, but have arranged for a Hot Pot Supper on that date in the Refectory of the Manchester College of Technology.

A JOINT MEETING of the Chemical Industry Club and the London Section of the Society of Chemical Industry will be held on Tuesday, December 13, in the rooms of the Institution of Mechanical Engineers, Storey's Gate, Westminster, at 8 p.m., Mr. W. J. U. Woolcock, M.P., in the chair. Cinematograph films on "The Winning and Working of Sulphur" (lent by Chance & Hunt, Ltd.); "The Manufacture of Steel Crucible, Open Hearth, Electric, and Bessemer Processes" (lent by Mr. W. H. Hatfield, of the Brown-Firth Research Laboratories, Sheffield); and "The Metallurgy of Zinc," will be shown. Admission will be by ticket, to be obtained from the Hon. Secretary of the Chemical Industry Club, or from the Hon. Secretary of the London Section of the Society of Chemical Industry. It is announced that, the number of tickets being limited, they will be allotted in the order in which applications are received.

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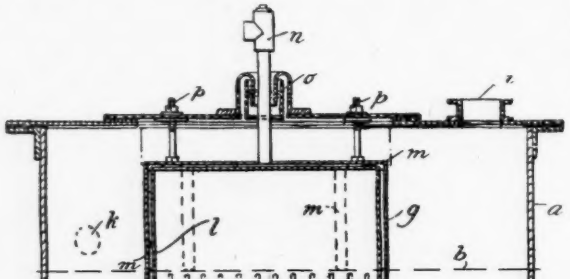
Abstracts of Complete Specifications

170,613. AMMONIUM SULPHATE, MANUFACTURE OF. South Metropolitan Gas Co., 709, Old Kent Road, London, S.E. 15, and P. Parrish, 64, Foyle Road, London, S.E. 3. Application date, April 30, 1920.

The process is for eliminating cyanogen compounds from the ammoniacal gases which are passed into a saturator to produce ammonium sulphate. When neutral ammonium sulphate crystals are required the liquor in the saturator should be maintained with a low acid content, but when gases obtained from coke-oven by-product recovery plant are being treated, the acid content of the liquor must be maintained considerably higher to avoid discoloration of the ammonium sulphate due to absorption of the cyanogen compounds from the gases. It is now found that the cyanogen compounds may be retained in the ammoniacal liquor by adding a polysulphide such as ammonium polysulphide to the latter before distillation. Alternatively the gases from the still are passed through a polysulphide solution, or the polysulphide may be produced by adding finely-divided sulphur or by passing the gases through spent oxide. In all cases the cyanogen compounds are absorbed as sulphocyanides.

170,617. STILLS FOR DISTILLING TAR, OILS, AND THE LIKE. Thermal Industrial and Chemical (T.I.C.) Research Co., Ltd., Sir A. M. Duckham and J. S. Morgan, 52, Grosvenor Gardens, London, S.W. 1. Application dates, May 26, 1920, and December 8, 1920.

The apparatus is for the heat treatment of liquids by passing them through a molten metal, and is particularly applicable to the distillation of tar, oils, and the like. A steel vessel *a* contains lead or other suitable metal or alloy up to the level *b*, the metal being kept molten by furnace gases which are passed through tubes in the lower part of the vessel *a*. A hollow closed cylinder *l* is fixed to the bottom of the still, and is enclosed by a hood *g*, which is slightly spaced from it by strips *m* so as to enclose a narrow annular space within the hood. The space between the top of the hood and the cylinder *l* is adjustable by means of nuts *p*, and the liquid-supplying pipe *n* passes through a liquid seal *o* to allow of this adjustment. The liquid escapes into the molten metal by means of slots at the lower edge of the



170,617.

hood, and the distillation gases escape through the outlet *i*. The residual liquid is drawn off through the outlet *k*. In a modification, the liquid is discharged from the hood *g* just below the lower end of a flat plate immersed in the molten metal, and very slightly inclined to the horizontal. Circulation of the molten metal is maintained by providing short open tubes which project downwards through the plate at its lower end, while the plate is spaced at its upper end from the wall of the still. The liquid to be distilled thus passes upwards along the under surface of the inclined plate to its free edge, the time of immersion being dependent on the length of the plate. By this apparatus a sufficiently rapid flow of liquid is maintained within the hood *g* to prevent its rise of temperature to a point at which frothing would take place.

170,682. CAOUTCHOUC AND CAOUTCHOUC-LIKE PRODUCTS, MANUFACTURE OF. P. Schidrowitz, 57, Chancery Lane, London, W.C. 2, and Catalpo, Ltd., 20, Holborn Viaduct, London, E.C. 1. Application dates, July 28, 1920, and April 15, 1921.

The process is for the production of an accelerator for addition to vulcanisable rubber mixtures. The accelerator used is a carbon bisulphide derivative of an organic base such as piperidene, and this substance is associated with a "carrier" or filler, such as clay, zinc oxide, french chalk, light carbonate of magnesia, or calcium carbonate, but preferably colloidal clay is used . The "carrier" may be impregnated with one component of the accelerator and may then be sprayed with or treated with the vapour of the other component. The clay is dispersed in a fluid medium by adding a peptising (deflocculating) reagent such as ammonia, sodium hydrate, or sodium carbonate, and is then recovered from the dispersion in known manner. In an example 100 lb. of china clay treated as above are sprayed with 20 lb. of commercial piperidene with continuous stirring, and the mixture is then ground and spread on trays in a closed chamber; 16 lb. of carbon bisulphide are placed in the chamber and left to evaporate until no further absorption by the clay takes place. The reaction may be facilitated by warming, and the final product contains about 20 per cent. of the piperidene derivative. An indiarubber mixture in which the accelerator is used may consist of indiarubber 200 parts, sulphur 16 parts, accelerator 5 parts, and zinc oxide 5 parts. Vulcanisation of the mixture is complete in about two minutes at 286°F. instead of about two to three hours which would be required without the accelerator. Other "carriers" and different proportions of the piperidene derivative may be used in a similar manner.

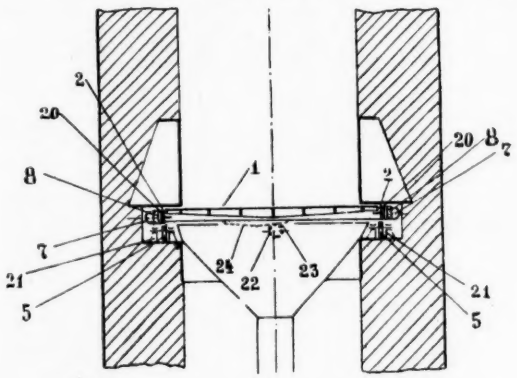
170,743. CHARGING AND DISCHARGING GAS RETORTS AND THE LIKE, APPARATUS FOR. C. Hollander, 14, Vivian Gardens, Wembley Hill, Middlesex. Application date, March 21, 1921.

The contents of a horizontal gas retort are discharged by means of a ram or pusher which is forced into the retort from one end. The ram is formed of link-like sections placed end to end and pivoted together at their upper edges, so that the ram may be bent in an upward but not in a downward direction. The end section of the ram is pivoted to the periphery of a polygonal drum, so that the sections of the ram may be wound on or off the drum so as to withdraw the ram from or force it into the retort. The links forming the ram constitute a horizontal trough when extended, in which a horizontal endless conveyor is arranged. The conveyor chain passes around a guide pulley at each end of the ram and is wound on to the drum with the ram. The upper side of the conveyor is carried around a driving pulley with fixed axis, so that the conveyor may be operated in any position of the ram. After the ram has been pushed forward to discharge the retort, the conveyor is brought into operation to refill it with fresh material. The conveyor is driven at such a rate that the fuel which is carried on its upper surface is projected forward over the head of the ram into the retort. The conveyor is given an upward direction immediately behind the head of the ram so as to project the fuel in an upward as well as a forward direction during the gradual withdrawal of the ram.

170,764. CEMENT, MAGNESITE, AND SIMILAR SUBSTANCES, SHAFT FURNACES FOR BURNING. A. Hauenschild, Vilmos Csaszar ut 28, Budapest, Hungary. Application date, October 25, 1920.

Shaft furnaces for burning cement or magnesite are sometimes provided with removable grates rotating about a vertical axis to facilitate the discharge of the furnace. In such grates the middle portion is ineffective owing to its slow movement, and in addition the contents of the furnace sometimes fuse to the walls of the furnace in the clinkering zone owing to the slow downward movement. In the present invention the rotation of the grate is combined with a periodic up and down movement. The grate 1 is carried by a frame 2 mounted on eccentric rollers 5. The frame 2 is connected to a surrounding frame 20 carrying a worm wheel 8 driven by worms 7. The two worms 7 are connected by bevel gearing to a shaft which may be rotated in either direction,

as desired, or may be rotated in opposite directions alternately by automatic reversing devices. The rotation of the grate is accompanied by a simultaneous rising and falling due to



170,764.

the rolling of the frame on the eccentric rollers 5. In an alternative device the eccentric rollers may be replaced by rollers 22 journalled centrally, which co-operate with inclined surfaces 23, 24 during the rotation of the grate.

170,781. Soap, Manufacture of. J. Tseng, 4, Romola Road, Herne Hill, London, S.E. 24, and of the Wheatley Engine Co., Armley Works, Town Street, Armley, Leeds. Application date, December 9, 1920.

The process is for the manufacture of soap which is transparent immediately on manufacture. The ingredients comprising the soap are as follows: Russian tallow 35 parts, Cochin cocoanut oil 30 parts, castor oil or other vegetable oil 25 parts, glycerine 10 parts, caustic soda 13.9 parts, caustic potash 3 parts, water 30-35 parts, and 95 per cent. alcohol 35-40 parts. The glycerine may be replaced by 15 parts of sugar dissolved in 15 parts of water. The oil, fats, and glycerine are first melted in a steam-jacketed vessel, stirred for ten minutes, and the temperature raised to 75°C. Cold caustic solution is then added and the mixture stirred for fifteen minutes, and then raised to 80°C. for two hours with frequent stirring. The alcohol is then added and the mixture kept at 80°C. for eight hours with frequent stirring, so that the soap is dissolved in the alcohol. The temperature is then raised to 85°C. for another four hours, and is then reduced to 75°C., when it is run into a filter heated to the same temperature by a steam jacket. The filtered soap is then maintained at 75°C. for another four hours, and is finally run into a frame. If cane sugar is used instead of glycerine, it is dissolved in water at 75°C. and added to the mixture after the twelve hours' heating period. The soap is transparent on cooling.

170,788. Vacuum Filtration Apparatus. A. T. Cartner, 8, Grecian Street, Lower Broughton, Manchester; R. Clewer, Bell House, Delph, near Oldham; and Mather & Platt, Ltd., Park Works, Newton Heath, Manchester. Application date, January 21, 1921.

The apparatus is of the kind in which the liquid gravitates into a filter and is drawn through it into a receiver by means of a vacuum pump. The object is to prevent the withdrawal of the filtered liquid into the pump when the receiver is full. A closed vessel is inserted in the pipe line between the receiver and the pump, into which the inlet pipe projects downwards through the cover nearly to the bottom, while the outlet pipe connexion to the pump projects through the cover only. When the plant is working normally the receiver and the closed vessel are exhausted by the pump. When the receiver is full, the liquid flows into the closed vessel and lifts a floating ball valve which closes the outlet of the vessel to the pump. At the same time another float is raised by the liquid, and opens a valve which admits air into the vessel and so destroys the vacuum. The filtration is thus stopped and the filtrate cannot be drawn into the pump. The closed vessel may contain horizontal grids which support absorbing material which absorbs corrosive gases given off from the filtered liquid during the normal working of the apparatus. When liquid is withdrawn from the receiver, the ball valve is automatically opened and the air admission valve closed, so that the apparatus is restored to its normal condition.

Note.—Abstracts of the following specifications which are now accepted appeared in The Chemical Age when they became open to inspection under the International Convention: 145,055 (Akt.-Ges. fur Anilin Fabrikation) relating to triazo dyestuffs capable of being diazotised, *see* Vol. III., p. 242; 145,522 (Akt.-Ges. fur Anilin Fabrikation) relating to sulphurised dyestuffs, *see* Vol. III., p. 292; 149,354 (R. Arnot) relating to azo dyes, *see* Vol. III., p. 543; 149,974 (R. Fischer) relating to converting combustible substances into soluble organic compounds, *see* Vol. III., p. 569; 160,810 (Soc. L'Azote Francaise) relating to fertilisers, *see* Vol. IV., p. 627.

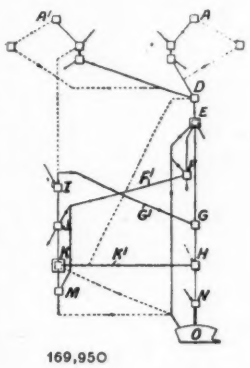
International Specifications not yet Accepted

169,948. Ammonium Chloride. O. L. Christenson, 36B, Karlbergsvägen, Stockholm, and B. A. Hedman, 59, Ostermalmsgatan, Stockholm. (Assignees of K. I. M. Gisiko, 34, Handtverkaregatan, Stockholm.) International Convention date, October 6, 1920. Addition to 159,817.

Specifications 159,817 and 161,161 (*see* The Chemical Age, Vol. IV., p. 567 and 654) describe a process for obtaining ammonium chloride by the distillation of coal in the presence of an alkali or alkaline earth chloride and silica. In the present invention free hydrochloric acid is also added to the charge.

169,950. Reducing Iron and Other Ores. Trent Process Corporation, 1440, U Street, Washington, U.S.A. (Assignees of W. E. Trent, 908, G Street, Washington, U.S.A.) International Convention date, October 4, 1920.

The ore and coal from receptacles A, A′ respectively are pulverised and fed to a mixer D and thence to a furnace E. The mixture is heated to 300°-400°C. and the iron is partly reduced and the coal partly distilled. The ore passes to a magnetic separator G, the heavy by-products to a condenser F, and the gases to a combustion chamber N. Carbon dust, &c., passes through a pipe G′ to a mixer I, where water is added, and thence to a mixer J, which is connected by a pipe F′ to the condenser F. A mixture of coal and oil is thus obtained and is distilled in a retort K at a low temperature The residue passes by a pipe K′ to a mixer H, and the mixed ore and residue then pass to the reducing furnace N, which is heated by reducing gases. The distillate from the retort K passes through the condenser M, and the oil thus obtained is returned to the mixer J. The reduced metal is finally collected on a hearth O.



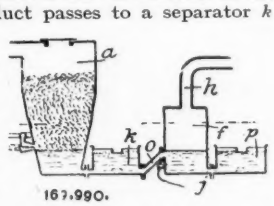
169,950

169,962. Fatty Acids. M. Melamid, 9, Urachstrasse, Freiburg, Breslau, Germany. International Convention date, October 2, 1920.

The liquid resin obtained during the manufacture of cellulose from wood by the sodium sulphite process is hydrogenated under pressure in the presence of a nickel catalyst. Fatty acids suitable for the manufacture of soaps are obtained.

169,990. Treating Ores. G. Freydier-Dubreul, 1, Place de la Miséricorde, Lyons, France. International Convention date, October 5, 1920.

A mixture of a complex ore and a flux is smelted in an electric furnace *a*, and the product passes to a separator *k* for the separation of the heavy metals and matte from the lighter portions. The separator *k* comprises three compartments separated by partitions, the mixture being received in the middle compartment. The heavier portions pass into one side compartment, and the lighter portions into the other side compartment, and thence by a passage *o* to a furnace *f*. The furnace may be externally heated, or fuel may be supplied through the passages *i*. The mixture is reduced in the furnace *f*,

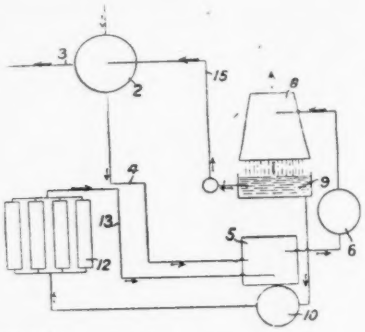


169,990.

and molten metals are separated in the separator *p*. Volatile metals such as zinc are drawn off at the outlet *h*, and volatile oxides of antimony or arsenic are recovered from the furnace *a* in the first stage of the process.

169,996. Gas Manufacture. Koppers Co., Union Arcade Building, Pittsburg, Pa., U.S.A. (Assignees of C. J. Ramsburg, Union Arcade Building, Pa., U.S.A.) International Convention date, October 7, 1920.

Coke oven gas is freed from sulphur and cyanogen compounds and carbon dioxide by passing it through a scrubber 2 containing sodium carbonate. The liquor passes by a pipe 4 to a hot-well 5, and thence through a pump 6 to the top of a tower 8, in which it is cooled and revivified by means of



169,996.

air. Part of the liquor is withdrawn from the tank 9 by the pump 10, and circulated through the primary gas coolers 12, and thence to the hot-well 5. The remainder of the liquor is returned direct to the scrubber 2. This preliminary purification of the gas reduces the amount of iron oxide necessary for the subsequent purification.

Latest Notifications.

171,661. Manufacture of compositions and technical products containing ethers of carbohydrates having the empirical formula $n(C_6H_{10}O_5)$, their conversion products, and derivatives. Lilienfeld, L. May 15, 1920.

171,670. Process for the reclaiming and recovery of coal from water or other liquids. Holland, C. E. November 13, 1920.

171,680. Purification of palm kernel oil. Soc. Rocca, Tassy, and De Roux. November 18, 1920.

171,684. Process for reclaiming sludge acid in petroleum refining. Simonson, W. H., and Mantius, O. November 19, 1920.

Specifications Accepted, with Date of Application

146,871. Mono-azo-dyestuffs for dyeing wool, Manufacture of. Farbwerke vorm. Meister, Lucius and Brüning. June 30, 1914.

147,118. Butyric aldehyde and butyl alcohol from crotonic aldehyde. N. Grünstein. January 4, 1919.

147,119. Aldol from acetaldehyde, Manufacture of. N. Grünstein. March 18, 1919.

147,906–7. Polyvalent alcohols, Process for the production of. O. Matter. December 8, 1913, and April 21, 1915. 147,907 addition to 147,906.

149,318. Alkali cellulose, Manufacture of. L. Lilienfeld. August 1, 1919.

149,662. Sulphur dioxide, Manufacture of, by heating sulphates of alkaline earths, magnesium and iron. Verein Chemischer Fabriken in Mannheim. August 8, 1919.

149,979. Resinous bodies from phenols and oxygen, Production of. F. Fischer. May 24, 1919.

154,558. Distilling liquids such as mineral oils, alcohol and the like, Method of. L. Granger, C. Mariller and Soc. Anon. d'Exploitation de Procédés Evaporatoires (Système Prache et Bouillon). November 26, 1920.

161,924. Methane, Manufacture of. Farbwerke vorm. Meister, Lucius and Brüning. April 15, 1920. Addition to 146,110.

163,017. Ethers of carbohydrates having the empirical formula $n(C_6H_{10}O_5)$, their conversion products and derivatives. L. Lilienfeld. May 5, 1920.

164,306. Iodine compounds, Manufacture of. R. Benko. June 1, 1920.

170,944. Ore concentration. L. A. Wood, W. G. Sellers and Minerals Separation, Ltd. July 30, 1920.

170,964. High percentage sulphite cellulose, Process for the production of. E. Bronnert. August 4, 1920.

170,982. Filling material for use in Glover towers and similar apparatus. P. Kestner. August 18, 1920. Addition to 131,502.

171,046. Rubber compounds and process of manufacture. C. F. S. Bilbrough, November 30, 1920.

171,125. Viscose artificial silk, Manufacture of. E. Bronnert. May 14, 1920.

171,132. Furnace and process of combustion. F. Seymour. July 2, 1920.

171,136. Cellulose waste sulphite dyes, Process for obtaining tanning materials from. A. Romer and Deutsch-Koloniale Gerb- & Farbstoff Ges. July 7, 1920.

171,149. Chromic sulphate, Manufacture of a solution of. F. M. Mooney. August 4, 1920.

171,152. Destructive distillation of carbonaceous substances. E. C. Evans. August 5, 1920.

171,155. Fertiliser, Production of. W. Broadbridge and E. Edser. August 6, 1920.

171,213. Bituminous sand, coal, oil shale, and other materials which yield hydrocarbons, Process for distilling. A. E. O'Dell. (*Canadian American Finance and Trading Co., Ltd.*) August 23, 1920.

171,266–7–8. Hydraulic separators for minerals and other solids. E. G. Weddell. September 24, 1920.

171,281. Calcium, magnesium, and lithium acetylsalicylates. Howards & Sons, Ltd., and J. W. Blagden. October 6, 1920.

171,282. Coal gas, Manufacture of. Thermal Industrial & Chemical (T.I.C.) Research Co., Ltd., and J. S. Morgan. October 6, 1920.

171,292. Anthraquinone derivatives, Manufacture and production of. J. Y. Johnson (*Badische Anilin & Soda Fabrik*). October 19, 1920.

Applications for Patents

Accioly, F. de M. Treatment of mineral, &c. oils. 31,735 November 25.

Activated Sludge, Ltd. Treating sewage, &c. 31,164. November 22.

Chemical Research Syndicate, Ltd. Production of low-boiling point saturated hydrocarbons from heavy hydrocarbon oils. 31,086. November 21 (United States, January 28).

Cross, W. (*Technochemia Akt.-Ges.*). Manufacture of artificial silk, &c. 31,497. November 24.

Dutt, E. E., and Wilson, A. H. Process for manufacture and extraction of titanium dioxide and vanadium oxide from bauxite ores. 31,055. November 21.

Godfrey, S. H. Process for manufacture and extraction of titanium-dioxide and vanadium-oxide from bauxite ores. 31,055. November 21.

Hersey, S. Machine for disintegrating oxide of iron, &c. 31,393. November 23.

Lemmens, G. J. Manufacture of margarine, &c. 31,524. November 24.

Mantius, O. Process for reclaiming sludge acid in petroleum refining. 29,763. November 8. (United States, November 19, 1920.)

Meter, J. W. van. Method of diffusing and disseminating poisonous gases. 31,085. November 21 (United States, April 11).

Moritz, R. Stirring-devices for mechanically-operated sulphate furnaces. 31,087. November 21 (Belgium, November 23, 1920).

—— Manufacture of sulphuric acid. 31,239. November 22 (Belgium, November 23, 1920).

—— Mechanical sulphate furnaces. 31,240. November 22 (Belgium, November 23, 1920).

—— Apparatus for measuring acids, &c. 31,241. November 22 (Belgium, November 23, 1920).

O'Shaughnessy, F. R. De-colloiding of colloidal organic matter.

Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. Apparatus for synthesis of ammonia. 30,005. November 10. (France, January 14.)

Stockholms Superfosfat Fabriks Aktiebolag. Method of manufacturing a catalyst for production of acetone from acetic acid, &c. 29,872. November 9. (Sweden, November 9, 1920.)

Stokes, J. S. Synthetic resin composition. 30,688. November 17.

—— Sound records. 30,689. November 17.

Whyte, D. Process for conversion of sulphate of lead water paste into oil paste. 30,089. November 11. 31,194. November 22.

Zdanowich, J. O. Cellulose acetates. 31,233. November 22.

Catalogue Received

We have received from Mr. A. E. Harris, of 71, Finsbury Pavement, London, E.C. 2, an attractively printed catalogue of fume condensing and dust collecting plants. It contains a number of illustrations of filter dust collectors and several diagrammatic sketches showing their application in various kinds of chemical installations.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

Market Report

Thursday, December 1, 1921.

THERE has been a fairly active demand for chemicals, but buyers' requirements, on the whole, are on the small side; the volume of business, however, is slightly improving. There is a marked scarcity of Continental offers, particularly from Germany, and, broadly speaking, the prices of most commodities are firming up.

There is no outstanding feature in the export situation.

General Chemicals

ACETONE is firmer in price, and remains in good enquiry.

ACID ACETIC.—The realisation of certain stocks continues, and an improvement in value seems to be inevitable before long.

ACID CITRIC is dull and uninteresting.

ACID FORMIC is in fair demand, and stocks are passing steadily into consumption.

ACID OXALIC is slow of sale, but the price is fully maintained.

ACID TARTARIC is quite inactive, and the tendency would seem to be towards lower values.

ARSENIC has been rather quieter, and is without change in price.

BICHROMATES.—There is a fair demand of the hand-to-mouth variety, but the volume of business is unsatisfactory.

BLEACHING POWDER.—There is nothing new to repeat; the demand is very slow and stocks are accumulating.

COPPER SULPHATE is uninteresting.

FORMALDEHYDE is in steady demand, and prices are firmer.

IRON SULPHATE is unchanged.

LEAD ACETATE.—The market is overstocked, and business can be placed below the current quotations.

LEAD NITRITE.—The demand has been, perhaps, a little better, but the improvement is very slow.

LITHOPONE.—A small business is reported, without change in price.

POTASSIUM CARBONATE and POTASSIUM CAUSTIC are largely offered on resale account, and the tendency is weak.

POTASSIUM CHLORATE is in good supply; nevertheless, a stronger tendency is maintained.

POTASSIUM PRUSSIATE.—Stocks are short, and higher prices are not unlikely.

SODIUM ACETATE.—A brisk export demand has steadied the market.

SODIUM CAUSTIC is still in demand on export account, but the current limits are not entertained by makers.

SODIUM NITRITE.—There is only a nominal hand-to-mouth business, and the price is firm.

SODIUM PRUSSIATE is still in very short supply; small parcels which become available are eagerly snapped up, and the tendency is towards higher prices.

Bichromates

The English makers have reduced their price for BICHROMATE SODA to 6d. per lb. net and for BICHROMATE POTASH to 7¾d. per lb. net carriage paid to consumers' works; contracts for forward delivery are subject to a falling clause.

Coal Tar Intermediates

Business during the past week has continued on quiet lines, and buyers are still very averse from buying more than their immediate needs.

ALPHA NAPTHHOL remains an uninteresting market.

ALPHA NAPHTHYLAMINE has been in slightly better demand, but the price remains unchanged.

ANILINE OIL AND SALT are very firm, and fair-sized orders have been placed.

BENZALDEHYDE has been enquired for.

BENZIDINE BASE is lifeless.

BETA NAPHTHOL continues in quiet supply at last quoted values.

DIMETHYLANILINE has been enquired for on export account.

DIPHENYLAMINE continues firm.

"H" ACID has been a little more interesting.

NITRO BENZOL continues in regular supply.

PARANITRANILINE is steady.

RESORCIN has been enquired for

Coal Tar Products

The market generally in coal tar products is rather more active, and a fair amount of business in various products has been done. Prices, however, continue to have a downward tendency.

90's BENZOL is obtainable at 2s. 6d. per gallon on rails, and is becoming more plentiful.

PURE BENZOL is still scarce, and is quoted 3s. 6d. to 3s. 8d. on rails in the Midlands and 4s. in London.

CREOSOTE OIL is still weak, with a downward tendency; to-day's price is about 6d. on rails in the North and 6½d. to 7d. in the South.

CRESYLIC ACID is worth about 2s. 3d. to 2s. 4d. on rails for the Pale quality, and 1s. 10d. to 2s. for the Dark.

SOLVENT NAPHTHA has a distinctly easier tendency and is worth about 2s. 5d. to 2s. 6d. on rails in the Midlands and 2s. 10d. to 2s. 11d. in London.

NAPHTHALENE remains a weak market, with little enquiry.

PITCH.—The market is weak and irregular. To-day's values are about 42s. 6d. to 45s. f.o.b., London, and 37s. 6d. to 40s. f.o.b., Hull.

Sulphate of Ammonia

The market remains steady without change of price. The home trade is less active, but there is a good demand for export.

Current Prices

Chemicals

	per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	2	1	to	0	2	2
Acetone oil	ton	87	10	0	to	90	0	0
Acetone, pure	ton	87	10	0	to	90	0	0
Acid, Acetic, glacial, 99-100%	ton	52	10	0	to	55	0	0
Acetic, 80% pure	ton	45	0	0	to	48	0	0
Arsenic	ton	95	0	0	to	100	0	0
Boric, cryst.	ton	65	0	0	to	68	0	0
Carbolic, cryst. 39-40%	lb.	0	0	6½	to	0	0	7
Citric	lb.	0	2	5	to	0	2	6
Formic, 80%	ton	65	0	0	to	67	10	0
Gallic, pure	lb.	0	3	10	to	0	4	0
Hydrofluoric	lb.	0	0	8½	to	0	0	9
Lactic, 50 vol.	ton	40	0	0	to	43	0	0
Lactic, 60 vol.	ton	43	0	0	to	45	0	0
Nitric, 80 Tw.	ton	38	0	0	to	40	0	0
Oxalic	lb.	0	0	8	to	0	0	8½
Phosphoric, 1.5	ton	45	0	0	to	47	0	0
Pyrogallic, cryst.	lb.	0	7	6	to	0	7	9
Salicylic, Technical	lb.	0	1	2	to	0	1	3
Salicylic, B.P.	lb.	0	1	6	to	0	1	8
Sulphuric, 92-93%	ton	8	0	0	to	8	10	0
Tannic, commercial	lb.	0	3	0	to	0	3	6
Tartaric	lb.	0	1	5	to	0	1	6
Alum, lump	ton	18	0	0	to	18	10	0
Alum, chrome	ton	37	10	0	to	40	0	0
Alumino ferric	ton	9	0	0	to	9	10	0
Aluminium, sulphate, 14-15%	ton	12	0	0	to	13	0	0
Aluminium, sulphate, 17-18%	ton	15	0	0	to	16	0	0
Ammonia, anhydrous	lb.	0	1	10	to	0	2	0
Ammonia, .880	ton	35	0	0	to	37	0	0
Ammonia, .920	ton	22	0	0	to	24	0	0
Ammonia, carbonate	lb.	0	0	4	to		—	

	Per	£	s.	d.		£	s.	d.
Ammonia, chloride	ton	60	0	0	to	65	0	0
Ammonia, muriate (galvanisers)	ton	45	0	0	to	47	10	0
Ammonia, nitrate	ton	55	0	0	to	60	0	0
Ammonia, phosphate	ton	90	0	0	to	95	0	0
Ammonia, sulphocyanide	lb.	0	3	0	to	0	3	0
Amyl acetate	ton	150	0	0	to	160	0	0
Arsenic, white, powdered	ton	42	0	0	to	44	0	0
Barium, carbonate, 92-94%	ton	12	10	0	to	13	0	0
Barium, chlorate	lb.	0	0	11	to	0	1	0
Chloride	ton	15	0	0	to	16	0	0
Nitrate	ton	42	10	0	to	45	0	0
Barium Sulphate, blanc fixe, dry	ton	26	0	0	to	28	0	0
Sulphate, blanc fixe, pulp	ton	16	0	0	to	16	10	0
Sulphocyanide, 95%	lb.	0	1	6	to	0	1	0
Bleaching powder, 35-37%	ton	14	0	0	to		—	
Borax crystals	ton	31	0	0	to	32	0	0
Calcium acetate, Brown	ton	8	0	0	to	9	0	0
,, ,, Grey	ton	10	0	0	to	11	0	0
Calcium Carbide	ton	22	0	0	to	23	0	0
Chloride	ton	8	10	0	to	9	0	0
Carbon bisulphide	ton	60	0	0	to	62	0	0
Casein, technical	ton	85	0	0	to	90	0	0
Cerium oxalate	lb.	0	3	6	to	0	3	9
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	11	0	to	0	11	6
Oxide, black	lb.	0	10	6	to	0	11	0
Copper chloride	lb.	0	1	3	to	0	1	6
Sulphate	ton	29	10	0	to	30	10	0
Cream Tartar, 98-100%	ton	125	0	0	to	130	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde 40% vol	ton	85	0	0	to	90	0	0
Formusol (Rongalite)	lb.	0	3	9	to	0	4	0
Glauber salts, commercial	ton	5	5	0	to	5	10	0
Glycerine, crude	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols	gal.	0	2	8	to	0	2	9
Iron perchloride	ton	35	0	0	to	40	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	42	10	0	to	45	0	0
Carbonate (White Lead)	ton	44	0	0	to	47	0	0
Nitrate	ton	48	10	0	to	50	10	0
Litharge	ton	35	10	0	to	36	0	0
Lithopone, 30%	ton	26	0	0	to	28	0	0
Magnesium chloride	ton	12	0	0	to	13	0	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	9	10	0	to	10	0	0
Sulphate (Druggists')	ton	15	10	0	to	17	10	0
Manganese, Borate	ton	70	0	0	to	75	0	0
Sulphate	ton	70	0	0	to	75	0	0
Methyl acetone	ton	85	0	0	to	90	0	0
Alcohol, 1% acetone	ton	90	0	0	to	95	0	0
Nickel sulphate, single salt	ton	65	0	0	to	66	0	0
Nickel ammonium sulphate, double salt	ton	67	0	0	to	68	0	0
Potash, Caustic	ton	33	0	0	to	33	10	0
Potassium bichromate	lb.	0	0	7¾	to		—	
Carbonate, 90%	ton	31	0	0	to	33	0	0
Chloride 80%	ton	15	0	0	to	20	0	0
Chlorate	lb.	0	0	6	to	0	0	6½
Meta bisulphite, 50-52%	ton	120	0	0	to	125	0	0
Nitrate, refined	ton	45	0	0	to	47	0	0
Permanganate	lb.	0	0	11	to	0	1	0
Prussiate, red	lb.	0	2	4	to	0	2	6
Prussiate, yellow	lb.	0	1	2½	to	0	1	3
Sulphate, 90%	ton	20	0	0	to	22	0	0
Salammoniac, firsts	cwt.	3	5	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	26	0	0	to	27	0	0
Arsenate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	6	to		—	
Bisulphite, 60-62%	ton	25	0	0	to	27	10	0
Chlorate	lb.	0	0	4¼	to	0	0	4½
Caustic, 70%	ton	24	0	0	to	24	10	0
Caustic, 76%	ton	25	10	0	to	26	0	0
Hydrosulphite, powder, 85%	lb.	0	2	3	to	0	2	6
Hyposulphite, commercial	ton	15	0	0	to	16	0	0
Nitrite, 96-98%	ton	37	10	0	to	40	0	0
Phosphate, crystal	ton	23	10	0	to	25	10	0
Perborate	lb.	0	1	6	to	0	1	7
Prussiate	lb.	0	0	8½	to	0	0	9
Sulphide, crystals	ton	17	0	0	to	18	0	0
Sulphide, solid, 60-62%	ton	24	10	0	to	25	10	0
Sulphite, cryst	ton	15	0	0	to	16	0	0
Strontium carbonate	ton	80	0	0	to	85	10	0
Strontium Nitrate	ton	70	0	0	to	72	10	0
Strontium Sulphate, white	ton	7	10	0	to	8	10	0
Sulphur chloride	ton	41	0	0	to	42	0	0
Sulphur, Flowers	ton	13	0	0	to	14	0	0
Roll	ton	13	0	0	to	14	0	0

	Per	£	s.	d.		£	s.	d.
Tartar emetic	lb.	0	1	6	to	0	1	7
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Tin perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	5	to	0	1	6
Zinc chloride, 102 Tw.	ton	21	0	0	to	22	10	0
Chloride, solid, 96-98%	ton	50	0	0	to	55	0	0
Oxide, 99%	ton	36	0	0	to	37	0	0
Dust, 90%	ton	47	10	0	to	50	0	0
Sulphate	ton	21	10	0	to	22	10	0

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	3	0	to	0	3	3
Alphanaphthol, refined	lb.	0	3	6	to	0	3	9
Alphanaphthylamine	lb.	0	2	3	to	0	2	6
Aniline oil, drums extra	lb.	0	1	5	to	0	1	6
Aniline salts	lb.	0	1	6	to	0	1	7
Anthracene, 40-50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	3	9	to	0	4	3
Benzidine, base	lb.	0	5	6	to	0	6	0
Benzidine, sulphate	lb.	0	5	6	to	0	6	0
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzoate of soda	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	5	9	to	0	6	0
Betanaphthol	lb.	0	2	0	to	0	2	2
Betanaphthylamine, technical	lb.	0	7	0	to	0	7	3
Croceine Acid, 100% basis	lb.	0	3	9	to	0	4	0
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	6	9	to	0	7	0
Dinitrobenzol	lb.	0	1	5	to	0	1	6
Dinitrochlorbenzol	lb.	0	1	4	to	0	1	5
Dinitronaphthaline	lb.	0	1	6	to	0	1	8
Dinitrotoluol	lb.	0	1	8	to	0	1	9
Dinitrophenol	lb.	0	2	9	to	0	3	0
Dimethylaniline	lb.	0	3	9	to	0	4	0
Diphenylamine	lb.	0	4	6	to	0	4	9
H-Acid	lb.	0	7	6	to	0	8	0
Metaphenylenediamine	lb.	0	5	6	to	0	5	9
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	6	6	to	0	7	0
Monosulphonic Acid (2.7)	lb.	0	7	0	to	0	7	6
Naphthionic acid, crude	lb.	0	4	0	to	0	4	3
Naphthionate of Soda	lb.	0	4	3	to	0	4	6
Naphthylamin-di-sulphonic-acid	lb.	0	4	9	to	0	5	0
Nitronaphthalene	lb.	0	1	4	to	0	1	5
Nitrotoluol	lb.	0	1	3	to	0	1	4
Orthoamidophenol, base	lb.	0	15	0	to	0	18	0
Orthodichlorbenzol	lb.	0	1	1	to	0	1	2
Orthotoluidine	lb.	0	2	3	to	0	2	6
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	11	0	to	0	11	6
Para-amidophenol, hydrochlor	lb.	0	11	6	to	0	12	0
Paradichlorbenzol	lb.	0	0	7	to	0	0	8
Paranitraniline	lb.	0	4	6	to	0	4	9
Paranitrophenol	lb.	0	2	9	to	0	3	0
Paranitrotoluol	lb.	0	5	9	to	0	6	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	13	0
Paratoluidine	lb.	0	7	0	to	0	7	6
Phthalic anhydride	lb.	0	3	9	to	0	4	0
Resorcin, technical	lb.	0	5	6	to	0	6	0
Resorcin, pure	lb.	0	7	9	to	0	8	0
Salol	lb.	0	2	4	to	0	2	6
Sulphanilic acid, crude	lb.	0	1	4	to	0	1	6
Tolidine, base	lb.	0	6	6	to	0	7	0
Tolidine, mixture	lb.	0	2	6	to	0	2	9

French Potash

A FAIRLY good demand has prevailed during the past few weeks for kainit 14 per cent. and sylvinite 20 per cent., and, on the whole, prices for these grades are tending towards firmness. Although the unit prices of muriate and sulphate of potash have been reduced very appreciably since last season, there is a growing preference for the less concentrated forms of potash, especially for the grades which are not too bulky, such as sylvinite 20 per cent.

Recent Wills

Mr. E. Eastwood, of Dukinfield, Cheshire, formerly of Victoria House, Dukinfield, chemist and druggist ..... £1,13•

Mr. R. Barker, of Simpson Clough, Heywood, Lancs, bleacher, dyer, and finisher £95,424

Mr. A. V. Baxter, of Warstah, Lower Walton, near Warrington, managing director of the Erasmic Co., Ltd., Bloomsbury Street, London; Warrington; and Paris £4,781

German Chemical Market

FROM OUR OWN CORRESPONDENT.

Berlin, November 21, 1921.

FROM the economic point of view the actual state of the German chemical market is not altogether satisfactory, in spite of the decided boom that has been reported. Employment in the textile industry is good, and this activity is reflected in the dyestuffs industry. Interest appears to be concentrating upon alkalies and some pharmaceuticals, and these have advanced by fits and starts as a result. Export trade was improving with the continued downfall of the mark, but the effect of the recent sudden fall cannot yet be calculated. It is thought here that the strongest obstacles to the improvement of export trade are the Rhine sanctions, the general increase in foreign tariffs, and the Safeguarding of Industries Act.

The organic chemical industry depends upon inland raw materials with the exception of chrome-ores, phosphates, pyrites, and manganese peroxide. The upward tendency of foreign prices has been responsible for a considerable increase in the prices of these products. Values of domestic raw materials depend mainly on transport costs. Following on the 50 per cent. increase in the price of potassium chloride on April 21 last, a further increase of 37 per cent. came into force on September 1, and this served to harden the price of finished potash products, such as caustic potash, potassium carbonate, potassium chromate and bichromate and even some products of chlorine. Quotations for sodium chloride and its by-products remained more or less at the same level.

The following table (in marks per kilogramme) gives some idea of the difference between October and November prices for industrial chemicals :

	Domestic.		Export.	
	Oct.	Nov.	Oct.	Nov.
Caustic potash 88-92 per cent.	18.50	28	19.75	32
Caustic potash liquor 50° Bé	8.75	10	—	13
Caustic soda 125-128°	17	22	18.50	26
Magnesium chloride, fused	—	4	4	5.75
Potash carbonate 96-98 per cent.	16.50	21	17.50	23
Soda sulphide 30-32 per cent.	13	15	18	19
Zinc white, Red-Seal	19	29.50	23	36

The production of caustic soda has been sufficient for the needs of home-consumers, and stocks of soda ash were all bought by inland consumers. Glauber's salt is in good demand from glass factories; the metal industry is taking up sulphuric and muriatic acids in large lots. Hydrogen and oxygen are being bought in considerable quantities by autogenous welding and cutting plants. Formic and oxalic acids are now meeting with a fair market, although they were somewhat neglected some weeks ago. There was a fair demand during September for alumina and alumina salts. Hydrogen peroxide has not been exported to any great extent, but the domestic market has recently shown some signs of improvement. Business in wood-distillation products is still on the dull side. Although the nitrogen industry has had a sufficiency of fuel there have been many complaints regarding the quality of the coal.

The situation on the explosives market is very bad, while pharmaceuticals are experiencing a boom. Large orders have been received for photographic chemicals, but the profit is reported to be comparatively small owing to increased Customs rates abroad.

The fall of the mark resulted in business in perfumes and essential oils becoming more active, but as material for distillation has to be imported, prices have increased.

Phosphatic fertilisers have been on offer at a very low price owing to the State's support of agriculture, but the growing scarcity of railway waggons checks the sales and brings the danger of overstocking nearer. The market in skin-glue was indifferent at the beginning of the month, but has improved slightly of late. A shortage of soda crystals is anticipated.

Chemical and Dyestuff Traders

Safeguarding of Key Industries Act

THE Chemical & Dyestuff Traders' Association in a circular just issued to members announces that the Chemical Merchants & Users' National Vigilance Committee recently formed, on which the Association is represented by the Chairman (Mr. F. T. T. Reynolds) and Messrs. Victor Blagden and A. F. Butler, has had several meetings and is now engaged in going in detail into the list under Part I. of the Act to see what articles can be successfully challenged before Mr. Cyril Atkinson, K.C., the referee.

In response to inquiries, it is clear that considerable objection is felt in the trade to a large number of the articles on the list. The articles to which specific objection is taken amount to a considerable number, and the Association hopes that the Board of Trade will be induced to make some concession in response to the strong representations on behalf of the merchants interested.

With reference to phosphate of ammonia one firm points out that they have supplied this material to firms for many years past for timber-fireproofing, and with the present rate of duty plus increase of cost it would make it practically impossible for their customers to continue to use it. The pre-war price, it is pointed out, was £30 per ton; to-day's price is about £56 exclusive of duty. It will therefore be seen that the addition of 33⅓ per cent. to the latter price brings the total to about £74 per ton c.i.f. At this price people such as railway companies and ship-builders, who wish to use fireproof timber, would hesitate to do so owing to the excessive cost.

In response to an inquiry as to the position of wood creosote under the Act, the Board of Trade inform the Association that genuine wood creosote is not included in any of the lists which have been issued defining certain of the general descriptions of goods mentioned in the Schedule of the Act, nor does it fall under any of the remaining general descriptions. It is accordingly not liable to duty under Part I.

The Board of Trade also officially inform the Association that antimony salts is not in the list and therefore not dutiable. In view of the fact that this article has been held by the Customs to be dutiable because it contained antimony fluoride, this decision will be much appreciated in the trade.

The Association has been in communication with the Customs Authorities as to whether any regulations have been issued respecting importation of goods produced or manufactured in the British Empire. For example, can goods of certified Canadian origin, but bought in America and lying in New York, be admitted free of duty on a certificate sworn before the British Consul in New York? Would the same condition apply to any goods of similar origin coming from any country outside the Empire?

The Customs Authorities in their reply state that the relief afforded by sub-section (3) of section (1) of the Safeguarding of Industries Act applies only to goods shown to the satisfaction of the Commissioners to have been consigned from and grown, produced, or manufactured in the British Empire. For the purposes of the sub-section, goods are deemed to have been manufactured in the British Empire which would be treated as having been so manufactured for the purposes of section 8 of the Finance Act 1919 (which applies to Imperial Preference). In the hypothetical case mentioned by the Association the goods would apparently be consigned from New York, and no title to relief from the sub-section would exist in these circumstances.

Dr. C. H. Herty's New Appointment

As briefly announced in THE CHEMICAL AGE last week, Dr. C. H. Herty, well known as Editor of the *Journal of Industrial and Engineering Chemistry*, has been elected President of the Synthetic Organic Chemical Manufacturers' Association, U.S.A. In order to be able to devote his whole time to his presidency, Dr. Herty has resigned his editorship, and will be succeeded by Dr. Harrison E. Howe. Dr. Howe has acted as chief chemist to the Sanilac Sugar Refining Co., and in a similar capacity with the Bausch and Lomb Optical Co., of Rochester, N.Y. Later he became manager of the Montreal offices of A. D. Little, Inc., of Boston, Mass., and during the war he was consulting chemist of the nitrate division of the Ordnance Bureau of the United States Army. Until his election to the present position, Dr. Howe was head of the Division of Research Extension of the National Research Council.

Company News

CASTNER-KELLNER ALKALI CO., LTD.—A dividend of 5 per cent., payable on December 8, is announced, making, with the interim dividend already paid, 13 per cent. for the year ended September 30 last. For the previous year a dividend of 22 per cent. was paid.

SANTIAGO NITRATE CO., LTD.—In the course of his speech at the annual meeting on Monday the Chairman (Mr. E. Eyre) said that out of the profit of £15,197 the directors recommended a dividend of 7½ per cent., less income tax, and he saw no reason why they might not be justified in expecting a similar dividend next year.

LOW TEMPERATURE CARBONISATION, LTD.—Dealings in 40,928 ordinary shares of £1 each, fully paid, Nos. 200,001 to 240,928, have been specially allowed by the Stock Exchange Committee under Rule 148a. These securities will rank *pari passu* with those in which special settling days have already been appointed, as soon as they are identical and the certificates are ready for distribution, and with those for which an official quotation has already been granted as soon as they are identical and are officially quoted.

NITRATE RAILWAYS CO.—The Stock Exchange Committee have allowed dealings under Rule 148a in 503 preferred Converted ordinary shares of £10 each, Nos. 77,474 to 77,976, and 503 deferred Converted ordinary shares of £10 each, Nos. 77,474 to 77,976. These securities will rank *pari passu* with those in which special settling days have already been appointed, as soon as they are identical and the certificates are ready for distribution, and with those for which an official quotation has already been granted as soon as they are identical and are officially quoted.

QUEENSBOROUGH GLASS BOTTLE WORKS.—The accounts for the seventeen months to December 31, 1920, show a balance at the debit of the net revenue account of £5,368. The directors state that the delay in presenting the accounts is owing to the fact that the shares of the company having all been acquired in August, 1919, by British Glass Industries, Ltd., reconstruction of the company was contemplated. In view, however, of the stringent state of the financial market and depression in trade, such reconstruction scheme was frequently postponed, and has now been abandoned for the time being. The annual meeting was held at 40, Norfolk Street, W.C., on Tuesday.

LANGDALE'S CHEMICAL MANURE CO., LTD.—The report to September 30 last states that the past year has been the most disastrous experienced by the company and by the fertiliser trade generally. It has not been possible to resuscitate the company's foreign trade owing to drastic competition of continental makers selling below cost; they have also delivered into this country at prices which place English manufacturers at a serious disadvantage. There is a loss on the year's working of £28,020; from this has to be deducted the balance brought in of £984, leaving to be carried forward a debit of £27,036. No credit has been taken in the accounts for a substantial claim for refund of excess profits duty. The annual meeting was held on Wednesday at Half Moon Chambers, Bigg Market, Newcastle-on-Tyne.

Chemical Merchants' Vigilance Committee

THE Chemical Merchants and Users' National Vigilance Committee recently appointed by conferences convened by the London Chamber of Commerce has issued an appeal for a fund to enable action to be taken, where necessary, in cases arising out of the Safeguarding of Industries Act, and especially in test cases affecting chemicals included in the Board of Trade's list. The signatories to the appeal are: Messrs. Victor Blagden (Chairman of Committee), F. T. T. Reynolds, Chemical and Dyestuff Traders' Association, and F. W. Powell, British Chemical Trade Association (Vice-Chairman), James D. Kiley, M.P. (hon. treasurer), A. F. Butler, Ralph Gosnell, Horace Barrett, and Ernest J. Parry.

Contract Open

TENDERS are invited by December 8 for 400 gallons of butyl acetate, 50 gallons of methyl ethyl ketone, and 500 glass jars for pathological specimens. Full particulars may be obtained from the Supply Officer, Australia House, Strand, London.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. NO.
Budapest ..	Chemicals; pharmaceutical supplies	457
Spain (Municipality of Bilbao)	Chemicals; pharmaceutical goods	460
Zurich ..	Glassware	461
Zurich ..	Cod liver oil and allied products ..	463
Los Angeles ..	Heavy chemicals	469
Argentine ..	Chemical products; glassware ..	—
Trinidad ..	Lubricating oils and greases ..	—
Budapest ..	Manufacturers of colours ..	—
Milan ..	China clay	—
Milan ..	Essential oils; quinine salts; alkaloids	—

Tariff Changes

CANADA.—In connexion with the amendment of invoice certificates with respect to goods imported from December 31, it is reported that the Canadian Customs will not object to the use of present stocks of invoice forms held by United Kingdom exporters, provided that the additional clause relative to the fair market value of the goods is unmistakably included in the declaration as signed by the exporter. If this is impossible, the exporter's signature should be attached to the additional clause.

NYASALAND.—The following import duties are now in operation: Lubricating oils, petrol, &c., 6d. per gallon; scents and perfumed spirits, 25 per cent. *ad valorem*; and all other dutiable goods, 15 per cent. *ad valorem*. Drugs of the British Pharmacopœia are added to the present schedule of free goods.

BELGIUM.—As from November 7 the import duties on goods of German origin are increased, broadly speaking, to about double the ordinary rates. Among the goods affected are a number of heavy chemicals, soaps, dyes, chemical and laboratory glassware, gas retorts and crucibles of all kinds, perfumery, precision balances, &c. (a full translation of the schedule appeared in the Board of Trade *Journal*, November 17, pp. 522-528). All goods of the kinds affected by the decree arriving in Belgium from European countries other than Germany must be accompanied by certificates of origin (duly legalised by a Belgian consul in the country of export) in order to secure the benefit of the normal rates of duty.

FRANCE AND ALGERIA.—As from November 6 the "General" Tariff rate of duty on chloride of potassium is increased from 3 frs. to 30 frs. per 100 kilogs., and that on sulphate of potash from 4 frs. to 30 frs. per 100 kilogs. Both these products continue to be admitted free of duty under the "Minimum" Tariff. Consignments proved to have been despatched direct to France prior to the issue of the decree will be admitted at the former rates of duty.

GERMANY.—The importation of bone waste is permitted without licence as from November 1. The import duty on wood pulp (mechanical and chemical) is now reimposed.

ITALY.—The exportation of alloys of all kinds; lead scrap; "leucite," including that usable as a fertiliser; lubricating oils of all kinds; and potassium salts, except those for use as fertilisers; may now be effected without the requirement of an export licence.

Northampton Polytechnic Institute

LORD SOUTHWARK on Friday presented prizes and certificates to students at the Northampton Polytechnic Institute, St. John Street, London, E.C. 1. In addition to organ recitals before and after the presentation there were demonstrations of work in the chemical, physical, electro-chemical, and metallurgical laboratories and in the lecture-rooms and workshops. Other demonstrations included fuel and flue gas analysis; pyrometers and recording apparatus; and fuel economisers at work. This (Saturday) evening the members and students will hold their Annual Conversazione.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Partnerships Dissolved

MILES, John Richard, and MILES, John Oliver, oil and colour merchants, &c., 43, Mile End Road, London, E., under the style of John R. Miles & Son, by mutual consent as from April 1, 1920. Debts received and paid by J. R. Miles, who will continue the business.

TIBBS, John Evan, deceased, and TIBBS, Evan Llewellyn, oil, tallow, turpentine, &c., brokers, at 50-51, Lime Street, London, under the style of J. E. Tibbs, jun., as from June 7, 1921. Debts received and paid by E. L. Tibbs, who will continue the business.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

HARRISON, Joseph Alfred, 36, Robin Lane, Pudsey, druggist. £21 11s. 6d. October 17.

HENDERSON, Herbert, and wife, 40, North Parade, York, chemist. £14 6s. 11d. October 18.

RICHMOND, J. (trading as Wharton Beverage Co.), Fleming Street, Maryport, mineral water maker. £23 2s 7d. September 28.

SMITH, Harry, & CO., 2, Cooke Street, Hulme, Manchester, chemical dealers. £44 11s. 7d. October 17.

WESSON'S CASH DRUG STORES, 10, Dronfield Street, Leicester, chemists. £16 6s. 9d. October 5.

Bill of Sale

[*The undermentioned information is from the Official Registry. It includes Bills of Sale registered under the Act of 1882 and under the Act of 1878. Both kinds require re-registration every five years. Up to the date the information was obtained it was registered as given below; but payment may have been made in some of the cases, although no notice had been entered on the Register.*]

TIMMINS, Adrian Albert Leslie, 113, Lynn Street, West Hartlepool, druggist. November 25. £70.

New Companies Registered

The following list has been prepared for us by Jordan & Sons, Ltd., company registration agents, 116 and 117, Chancery Lane, London, W.C.2:—

AMAMI, LTD., 4-10, Chenies Street, Tottenham Court Road, W.C. 1.—Manufacturers of and dealers in chemicals. Nominal capital, £100 in 100 shares of £1 each. Directors to be appointed by subscribers. Qualification of directors, one share.

ASHWORTH, H. B., LTD., 15, Penny Street, Blackburn, Lancaster.—Producers and refiners of petroleum and oleaginous substances. Nominal capital, £4,000 in 4,000 shares of £1 each. Directors: R. F. Mottershead, H. S. Haworth, W. Aspinall, H. B. Ashworth, J. R. Potts. Qualification of directors, 250 shares.

ATRACINE ENAMEL CO., LTD., Hindley's Place, Forest Hill, London.—Manufacturers of oils, paints, pigments, and enamels. Nominal capital, £2,000 in 1,700 preference shares and 300 ordinary shares of £1 each. Directors: N. L. Yorke, F. D. R. Milne, M.C., E. Yorke, B. M. Yorke. Qualification of directors, £50.

PREVENSCAL BOILER PAINT CO., LTD., 4, St. Mary Axe, E.C. 3.—Manufacturers of chemical preparations, paints, pigments, &c. Nominal capital, £1,000 in 600 management shares, 150 ordinary shares, and 250 deferred shares of £1 each. Directors: F. Tyler, J. T. Leete, B. J. Leete, R. S. Larkin.

SHEPHERD, JAMES, LTD., 4, Liverpool Road, Birkdale, Southport, Lancaster.—Coal, coke, lime, petrol, and oil fuel merchants, &c. Nominal capital, £3,000 in 3,000 shares of £1 each. Directors: J. Ellis, W. White, W. Dickinson. Qualification of directors, one share.

TRAVERS & CLARK, LTD., Royal London Buildings, 196, Deansgate, Manchester.—Consulting chemists and consulting engineers, &c. Nominal capital, £2,000 in 200 ordinary shares and 1,800 preference shares of £1 each. Directors: M. W. Travers, F. W. Clark.

Chemical Works Organisation

The Need for Systematic Supervision

In the second of a series of lectures on "Chemical Works Organisation and Lay Out," delivered before the Newcastle-on-Tyne Section of the Society of Chemical Industry on November 23, Dr. W. B. Davidson said the efficiency of chemical works implied the possession of all the essentials he had mentioned in his first lecture; the word efficiency, however, had come to be used in the narrow sense of proportional yield from the raw materials employed. Using the word in that sense the profit obtained was not necessarily proportional to the percentage of efficiency. As a matter of fact, in certain cases where capital charges and other costs greatly exceeded the cost of materials one could afford to lower the efficiency very considerably providing the output was materially increased. True efficiency, he thought, could not be obtained without a thorough knowledge of the process, and that knowledge was most readily obtained by friendly competition and publicity. Secrecy had played a large part in chemical works in the past, but the war had lifted the veil a great deal, disclosing sometimes gross inefficiency, due to scientific ignorance. Given the necessary primary conditions as laid down in his first lecture the great essential to proper efficiency was intelligent and rigid supervision of a systematic kind.

In dealing with the cost of production, the lecturer emphasised the need of keeping a record of every detail, and he showed the dissected costs of the manufacture of typical chemicals, such as sulphuric acid contrasted with concentrated acid, pointing out the great differences that arose. He urged the great need for the employment of a reliable and speedy system of costing and described the elaborate but thorough and rapid Hollerith system now adopted by large undertakings. Refinements of measuring and testing were advocated where speed was not seriously interfered with thereby, as often the increased profits accruing could pay for the testing staff. He strongly recommended thorough systems of recording tests and the extensive use of graphs.

The Gas Industry and Applied Chemistry

In a paper on the above subject read before the members of the Chemical Society of the Cardiff Technical College, Mr. H. D. Madden, M.Inst.M.E., chief engineer of the Cardiff Gas Co., drew attention to the incalculable value of the by-products derivable from soft or high volatile coals and the urgent need for the prevention of the wasteful use of a precious and diminishing national asset. Coals containing volatile constituents should be carefully treated and the valuable products sorted out and utilised in their own particular spheres by constructive distillation. For this reason he thought gasworks practice offered a field of immense interest to chemists. In conclusion, he alluded to the work of the South Wales Institute of Engineers, and their recent exhibition of patents to increase the efficiency of coal-consuming appliances.

Lord Leverhulme on Art and Soap Making

Opening an exhibition of pictures at the Three Arts Club, London, on Monday, Lord Leverhulme said that, as a business man, and as a soap-maker in particular, he could not be supposed to know anything about art. The traditional relations between art and soap-making came into a typical novelette of his youth which he remembered. The soap-maker was hopelessly vulgar, with a white waistcoat, a tremendous gold chain, and a charming daughter whom he destined for the son of an insolvent duke. Art was represented on the scene by a fascinating young landscape-painter, who cut out the duke's son, and all ended happily with the perfect discomfiture of the vulgar soap-maker. Lord Leverhulme mentioned that architecture was his own favourite art.

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CHEMICAL AGE

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